US-Korea Conference
Korean-American Scientists & Engineers Association (KSEA)

UKC 2023 Dallas

Discovery, Innovation and Dissemination for Transformative Impact

Report

August 2-5, 2023
Hyatt Regency DFW
Dallas-Fort Worth, TX, USA
https://www.ukc.ksea.org

Co-Organized with

The Korean Federation of Science and Technology Societies (KOFST)

The Korea-U.S. Science Cooperation Center / National Research Foundation of Korea (KUSCO / NRF)

Korean - American Scientists and Engineers Association (KSEA)

UKC 2023

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Report from the 36th US-Korea Conference on Science, Technology and Entrepreneurship
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About UKC 2023

You are cordially invited to the US-Korea Conference (UKC) on Science, Technology and Entrepreneurship to be held August 2-5, 2023 at Hyatt Regency DFW (Dallas-Fort Worth area), TX, USA. UKC 2023 is co-hosted by three prestigious organizations: the Korean-American Scientists and Engineers Association (KSEA), the Korean Federation of Science & Technology Societies (KOFST), and the Korea-U.S. Science Cooperation Center / National Research Foundation of Korea (KUSCO / NRF).

The theme of UKC 2023 is "*Discovery, Innovation and Dissemination for Transformative Impact*." UKC 2023 will offer unique opportunities for participants to actively engage in discovery, innovation and dissemination through various symposiums and forums with emphasis on transformative impact on our daily lives, which have been challenged and altered through the pandemic and socio-economic impact of science, technology and entrepreneurship.

US-Korea Conference (UKC)

UKC provides an environment where convergence and innovation can be ignited and implemented. It can play a major role in the Creative Economy that requires interdisciplinary integration.

UKC can play a major role in reducing the technology gap with policy makers, and build the framework to tackle global challenges through science diplomacy.

UKC fosters peer networking and mentoring, and provides a platform for current and future leaders to meet in an environment where meaningful partnerships and friendships can form and grow.

UKC Communicates Science and Technology with the public, and cultivates Science, Technology, Engineering and Math (STEM) education to empower future generations.

https://www.ukc.ksea.org

UKC History

No.	Year	Dates	Venue	KSEA President
1	1974	7/28-8/8	Seoul, Korea	Inyong Ham
2	1976	7/26-8/6	Seoul, Korea	Chong Wha Pyun
3	1978	7/10-13	Seoul, Korea	Sang-il Choi
4	1980	7/14-19	Seoul, Korea	Kwang Bang Woo
5	1982	7/13-21	Seoul, Korea	Kyungsik Kang
6	1991	11/29-12/2	Arlington, VA	Moo Young Han
7	1994	9/22-26	Alexandria, VA	Moon Won Suh
8	1995	8/31-9/4	San Francisco, CA	Dewey Doo-Young Ryu
9	1997	2/21-24	McLean, VA	Saeyoung Ahn
10	1998	4/23-25	Chicago, IL	Kyong Chul Chun
11	1998	10/22-24	Vienna, VA	Ki Dong Lee
12	1999	8/12-14	Los Angeles, CA	Hong Taik (Thomas) Hahn
13	2000	9/2-5	Chicago, IL	Howard Ho Chung
14	2001	8/10-12	Cambridge, MA	Nak Ho Sung
15	2002	7/8-11	Seoul, Korea	Chan Il Chung
16	2003	8/7-9	Caltech, CA	Quiesup Kim
17	2004	8/12-14	RTP, NC	Sung Won Lee
18	2005	8/11-13	Irvine, CA	Kwang-Hae (Kane) Kim
19	2006	8/10-13	Teaneck, NJ	Sung K. Kang
20	2007	8/9-12	Reston, VA	Kang-Won Wayne Lee
21	2008	8/14-17	San Diego, CA	Kang-Wook Lee
22	2009	7/16-19	Raleigh, NC	Chueng-Ryong Ji
23	2010	8/11-15	Seattle, WA	Jae Hoon Kim
24	2011	8/10-14	Park City, UT	Hosin David Lee
25	2012	8/8-11	Los Angeles, CA	Hyungmin Michael Chung
26	2013	8/7-10	New York, NY	Myung Jong Lee
27	2014	8/6-9	San Francisco, CA	Kookjoon Ahn
28	2015	7/29-8/1	Atlanta, GA	Youngsoo Richard Kim
29	2016	8/10-13	Dallas, TX	Jaehoon Yu
30	2017	8/9-12	Washington, DC	Eun-Suk Seo
31	2018	8/1-4	New York, NY	K. Stephen Suh
32	2019	8/14-17	Chicago, IL	Jun-Seok Oh
33	2020	12/14-17	Virtual	Soolyeon Cho
34	2021	12/15-18	Los Angeles, CA	Byungkyu Brian Park
35	2022	8/17-20	Washington D.C.	Young-Kee Kim

* Note the moratorium practiced in the 4th meeting, 1980.

Remarks from UKC 2023 Chair

Yongho Sohn Ph.D.

UKC 2023 Chair & President of KSEA (Korean-American Scientist and Engineers Association)

UCF Pegasus Professor & Lockheed Martin Professor of Engineering

Department of Materials Science and Engineering
University of Central Florida

Welcome to the 36th US-Korea Conference on Science, Technology, and Entrepreneurship (UKC 2023), jointly organized by the Korean-American Scientists and Engineers Association (KSEA), the Korean Federation of Science and Technology Societies (KOFST) and the Korea-US Science Cooperation Center (KUSCO) / National Research Foundation (NRF). As the Conference Chair, I am thrilled to host this extraordinary event where visionaries, innovators, and leaders from the United States and Korea gather to foster collaboration, exchange knowledge, and shape the future of our interconnected worlds. We embark on a journey that celebrates the spirit of collaboration, pushing the boundaries of knowledge and unleashing the power of innovation to create a transformative impact on our world.

Over the years, UKC has evolved into an iconic platform that celebrates the synergistic relationship between the United States and Korea, two nations renowned for their scientific advancements, technological breakthroughs, and entrepreneurial spirit. In Dallas, Texas, we gather to "*discover, innovate, and disseminate for transformative impact*" by converging brilliance and expertise of all invited and contributing participants who are at the forefront of scientific breakthroughs, technological advancements, entrepreneurial endeavors, and policy innovations. UKC 2023 offers unparalleled, cross-disciplinary platform of science, technology and entrepreneurship for participants to actively engage in various plenary sessions, keynote symposia, technical symposia, professional development workshops, and focused forums offered by conference sponsors and organizers.

The spirit of discovery drives our progress and plays pivotal role of the relentless pursuit of knowledge, the exploration of uncharted territories, and the curiosity that fuels our souls that cornerstones advancements. At the heart of our endeavors lies engineering and technological innovation that fuse creativity, expertise, and the courage to challenge conventions by driving transformative change that solve complex problems for the benefit of our lives. Dissemination by effective communication, collaboration, and the sharing of knowledge accelerates and amplifies our impact, while inspiring others to join our mission. Together, we will explore new frontiers, forge meaningful partnerships, and shape a future that is both prosperous and sustainable.

I extend my sincere gratitude to our co-organizers, sponsors, the organizing team members, and volunteers for their tireless efforts in making this conference a resounding success. Your unwavering support has enabled us to curate a program that promises to fulfill the vision and mission of UKC 2023.

I invite you to immerse yourself in the vibrant atmosphere of UKC 2023. Engage in stimulating conversations, form lasting connections, and embrace the spirit of collaboration that lies at the heart of this conference. Let us harness the power of discovery, innovation, and dissemination to create a transformative impact that will shape our world for generations to come.

Welcome to UKC 2023!

Yongho Sohn
UKC 2023 Chair and President of KSEA

Remarks from UKC 2023 Co-Chair

Tai Sik Lee

UKC 2023 Co-Chair &
President of KOFST
(Korean Federation of
Science and Technology
Societies)

It is truly an honor and pleasure to welcome all the scientists and engineers from home and abroad, who are joining us at the US-Korea Conference 2023 on Science, Technology, and Entrepreneurship (UKC-2023), bringing with them a passion as intense as the scorching summer in Texas.

As we commemorate the 70th anniversary of the ROK-U.S. alliance and the 120th anniversary of Korean immigration to the United States this year, I find it deeply meaningful that we are here to host the 36th UKC in Texas, which is emerging as a new hub for Korea-U.S. technological alliance. In order to survive in the accelerating race for technological hegemony, the world is putting forth every effort to secure competitiveness in science and technology. Consequently, the collaboration through international cooperation in science and technology has become more important than ever. Technology cooperation is being bolstered by technology alliance, and cooperative competition is taking place alongside technology competition.

Now, Korea and the U.S. are moving beyond a security alliance towards an advanced technology alliance. In line with this, I hope that Korean-American scientists and engineers can serve as a bridge of innovation which connects the two countries, and that the UKC will be further upgraded as a platform for joint research and collaboration in science and technology. The theme for this year's UKC is "*Discovery, Innovation and Dissemination for Transformative Impact*". I believe that the theme holds profound importance to the Korean economy, which is grappling with challenges after a phase of prosperity driven by the fast-follower model. Indeed, the essence and mission of science and technology is to spread innovation to the entire society through constant exploration and discovery. Nevertheless, we find ourselves in the midst of crisis as we turn away from challenges and innovation in a social atmosphere that feeds a fear of failure. Strangely enough, the science and technology community, which is unwilling to embrace uncertainty and risk, boasts an astonishing 100% success rate in national research and development.

However, a research that is predestined for success offers little promise for the future. We must boldly transition to become first movers who fearlessly venture into uncharted territories, utilizing numerous failures as stepping stones. The global triumph of K-pop and K-contents, exemplified by BTS and Squid Game, provides a clear indication of the path that K-science should strive towards.

I, myself, have dedicated significant time and effort to space construction, an area that initially garnered interest only from NASA. During my tenure as the President of the Korea Institute of Civil Engineering and Building Technology, we achieved a significant milestone by creating the largest lunar exploration technology and equipment test chamber (dusty thermal vacuum chamber), which was yet to be developed by NASA. It is worth noting that, only recently, other space power countries have commenced their research efforts in space construction. On the other hand, we have produced world-class research outcomes in this field as we took on the challenge as a first mover.

I hope that this year's UKC serves as a valuable opportunity for scientists and engineers to reflect on their mission, which is to fearlessly pioneer new territories, undaunted by the prospect of failure.

Lastly, I would like to express my deepest gratitude to the dedicated staff of the Korean-American Scientists and Engineers Association (KSEA), including President Yongho Sohn, for their tireless efforts in organizing this remarkable event. I hope that this conference will provide a meaningful venue to engage in intense discussions and share insightful ideas. Once again, I would like to extend a warm welcome to all of you who are with us today, and wish you all the best in your future endeavors.

Thank you.

Tai Sik Lee
President of the Korean Federation of Science and Technology Societies

Remarks from KUSCO/NRF President

Kwang Bok Lee

President of Korea-U.S. Science Cooperation Center

President of National Research Foundation of Korea

Dear Esteemed Guests, Ladies and Gentlemen,

It is my great honor to welcome you to the US-Korea Conference 2023. I would like to express my sincere appreciation to all the participants who have joined us for this year's Conference. I am truly grateful to the speakers, policymakers, and leaders of the academic and research communities for enhancing the significance of this event with their presence.

Furthermore, I extend my heartfelt gratitude to the Korean-American Scientists and Engineers Association and the Korean Federation of Science and Technology Societies, particularly President Yongho Sohn and President Taesik Lee, respectively, for their unwavering efforts in organizing this conference.

In today's world, international cooperation in science and technology plays a crucial role in addressing global challenges, driving innovation, and promoting sustainable development. By leveraging the strengths of different nations, sharing knowledge, and fostering collaboration, we can effectively tackle complex problems, accelerate scientific progress, and build a better future for the world.

This year we celebrate the 70th anniversary of the ROK-U.S. alliance. This partnership becomes even more critical in the face of a rapidly changing global landscape and intensifying technological competition. Recent State Visits and the Joint Committee Meeting on Science and Technology have further strengthened this collaboration. In this context, the role of Korean researchers in the United States holds utmost significance in promoting collaboration in science and technology.

The theme of UKC 2023 is "*Discovery, Innovation, and Dissemination for Transformative Impact.*" In a world characterized by escalating competition and confrontation, we encounter various challenges and opportunities. In this era of transformation, it becomes imperative to seek innovative solutions that can profoundly impact our society and economy. Throughout this conference, we will explore the vital role of science, technology, and entrepreneurship in driving innovation and creating a transformative impact on our society.

I am truly confident that this conference will not only provide a platform for in-depth discussions and give us direction in this transformative era, but also offer an opportunity to strengthen the partnership between the two countries in the fields of science and technology. I hope that this event will offer you valuable insights and pave the way for fruitful collaborations.

Thank you once again for your participation in UKC 2023.

August 2023
Lee, Kwang Bok

President, Korea-U.S. Science Cooperation Center
President, National Research Foundation of Korea

Remarks from UKC 2023 Program Chair

Chang-Yong Nam

Scientist
Brookhaven National Laboratory

Greetings to all participants of the 36th US-Korea Conference on Science, Technology, and Entrepreneurship (UKC 2023).

As the annual flagship event of the Korean-American Scientists and Engineers Association (KSEA), UKC 2023 stands as a testament to the collaborative ties between the United States and Korea—two nations recognized for their contributions to scientific excellence, technological innovation, and enterprising spirit.

As the Program Chair, it is my great pleasure to extend a warm welcome to this distinguished gathering. At this event, esteemed experts, entrepreneurs, and policymakers from the United States and Korea come together to foster partnerships, exchange insights, and collectively shape the path of our interconnected world.

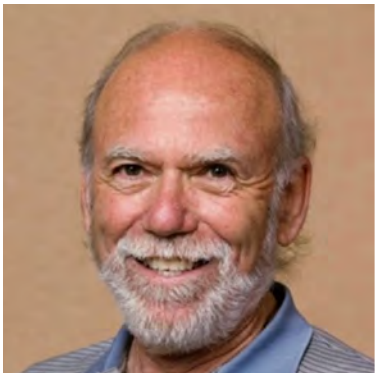
Set against the backdrop of the vibrant city of Dallas-Fort Worth, Texas, UKC 2023 centers around the theme, "*Discovery, Innovation, and Dissemination for Transformative Impact*", which aptly reflects the expertise of our invited participants and contributors, who are leaders in scientific advancements, technological progress, entrepreneurship, and policy innovation.

UKC 2023 presents a comprehensive program, featuring Plenary sessions, 4 Keynote Symposiums, and 14 Technical Group Symposiums. Additionally, it includes a dynamic Poster Session featuring nearly 130 poster presentations. Complemented by 9 Distinguished Forums, 8 Sponsor Forums, the Fostering Innovation in Rising Experts (FIRE) Symposium, the Innovation & Entrepreneurship Symposium (IES), the Data Science Workshop (DSW), and the Early Career Development (SEED) Workshop, this array captures the rich and diverse experience we aim to provide.

Lastly, I extend my heartfelt gratitude to our co-organizers, the dedicated members of the organizing team, the KSEA staff, and the volunteers. Their steadfast commitment has played a pivotal role in ensuring the success of UKC 2023.

With warm regards,
Chang-Yong Nam
UKC 2023 Program Chair

Plenary Speakers



Barry C. Barish

Nobel Laureate

Professor of Physics
Emeritus at Caltech,
President's Distinguished
Endowed Chair at
Stony Brook University

8am _ Thursday _ August 3 _ Enterprise Ballroom 1-4

Barry Clark Barish is a Linde Professor of Physics, Emeritus at California Institute of Technology and a leading expert on gravitational waves. Dr. Barish was awarded the Nobel Prize in Physics in 2017 along with Rainer Weiss and Kip Thorne "*for decisive contributions to the Laser Interferometer Gravitational-Wave Observatory (LIGO) detector and the observation of gravitational waves*". Barish received his bachelor's and doctorate in physics at the University of California, Berkeley, in 1957 and 1962, respectively. Starting the fall of 2023, he will serve as the inaugural President's Distinguished Endowed Chair in Physics at Stony Brook University.

Understanding our Universe with Gravitational Waves

The discovery of gravitational waves, predicted by Einstein in 1916, is enabling both important tests for the theory of general relativity, and the birth of a new astronomy. Modern astronomy, exploring all types of electromagnetic radiation, is giving us an amazing understanding of the complexities of the universe, and how it has evolved. Now, gravitational waves and neutrinos are beginning to give us the opportunity to pursue some of the same astrophysical phenomena in very different ways, as well as to observe phenomena that cannot be studied with electromagnetic radiation. The detection of gravitational waves and the emergence and prospects for this exciting new science will be explored.

Plenary Speakers

Jin Hyung Lee

Associate Professor of Neurology and Neurological Sciences, Bioengineering, Neurosurgery, and (by Courtesy) Electrical Engineering
Stanford University

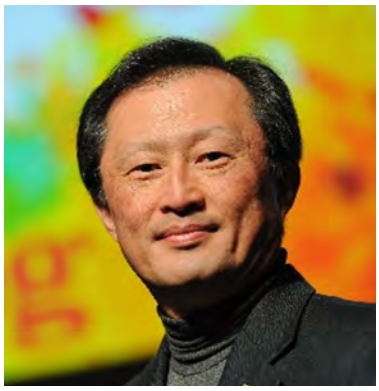
8am _ Friday _ August 4 _ Enterprise Ballroom 1-4

Jin Hyung is an Associate Professor of Neurology, of Neurosurgery and of Bioengineering and, by courtesy, of Electrical Engineering. The Lee Lab uses interdisciplinary approaches from biology and engineering to analyze, debug, and manipulate systems-level brain circuits. She seeks to understand the connectivity and function of these large-scale networks in order to drive the development of new therapies for neurological diseases. This research finds its basic building blocks in areas ranging from medical imaging and signal processing to genetics and molecular biology. Jin Hyung earned her B.S. in Electrical Engineering from Seoul National University, and MS and PhD from Stanford University in Electrical Engineering.

Creating a "*Digital Twin*" of the Brain

Brain disorders are dramatically increasing in prevalence with no cure to date. My research goal was to address this problem by creating a "*digital twin*" of the brain. A digital twin that can help address brain disorders would need to have three main features. First, it should replicate brain function that can be directly measured from the brain. Second, it should explain the mechanisms underlying the measured brain function. Third, it should be able to predict outcome of interventions that have not been tested yet. Through the past 15 years of research, we are now starting to create digital twins of the brain that achieve all three goals. With the ability to create such digital twins for individuals, we can imagine a future where diagnosis of each patient can be accurately done through inspection of the individual's digital twin, treatment can be selected based on the understanding of the mechanisms underlying the digital twin's dysfunction, and new therapies designed through simulations performed on the digital twin of the brain. In this talk, I will share our achievements to date and vision for the future of brain healthcare.

Plenary Speakers



Youngsuk "YS" Chi

Chairman of Elsevier
Director of Corporate Affairs, RELX

10:30am _ Saturday _ August 5 _ Enterprise Ballroom 1-4

YS Chi is a leader in the media and technology industry. In his primary role as Director of Corporate Affairs and Asia Strategy for RELX, he is responsible for government affairs, corporate communications, and corporate responsibility for RELX. As non-executive Chairman of Elsevier, he works directly with governments, Elsevier customers, and in industry associations worldwide. YS recently served as Chairman of the Association of American Publishers and has also concluded 4 years of service as the President of the International Publishers Association. He has also served on many charitable, educational and industry boards including the Korean American Community Foundation. YS earned bachelor's in Economics from Princeton University and MBA from Columbia University.

Navigating Careers in Science, Engineering, and Entrepreneurship in an Ever-Changing World

Mr. Chi will reflect on current realities of the global business and academic ecosystem and how they relate to career development for young scientists and professionals worldwide. Mr. Chi will consider questions around the chief issues faced in today's education, academic, and research landscapes, and how to best prepare for success in this ever-changing environment. He will offer insights from his experience as a leading Korean-American businessman, publishing executive, and mentor to hundreds of young people around the world.

2023 KSEA Awards

Jae Hoon Kim

Senior Technical Fellow, Boeing Research & Technology

Outstanding Contribution to KSEA Award

Dr. Jae Hoon Kim is an Executive and Senior Technical Fellow of Boeing Research & Technology (BR&T). During 32-year tenure at Boeing, Dr. Kim has served as PI and PM for a number of U.S. Department of Defense (DoD) programs for OSD(R&E), DARPA, Army DEVCOM C5ISR, Air Force AFRL, Navy ONR as well as Boeing internal R&D projects. Dr. Kim has also served as an Affiliate Professor of Electrical and Computer Engineering Dept. at University of Washington since 2000. Prior to joining Boeing High Tech Center in 1991, Dr. Kim was a Senior Research Scientist and Project Manager at Caltech / NASA Jet Propulsion Laboratory (1987-1991).

Dr. Kim is a nationally recognized expert and technical leader in wireless communications and mobile networking throughout the Industry and DoD Scientific Community. His unique experience in a wide range of communications systems during his 36-year career has resulted in an unusually broad and comprehensive technical expertise in Space Microelectronics, Optoelectronics, Fiber Optics, RF/Optic, Satellite, Wireless Communications and Networks, particularly on the military Tactical Mobile Ad-hoc Networks (MANET). Dr. Kim is an author/co-author of 100+ publications, has received 8 U.S. Patents and 2 International Patents (EU, UK, Germany, France, Japan, China), 25+ Boeing Technology Outstanding Performance Awards, 10 NASA Technology Innovation Awards, and 20+ DoD Research Project Contract Awards. Dr. Kim edited two books; "*Green IT: Technologies and Applications*" (Springer 2011), "*UAV Networks and Communications*" (Cambridge University Press 2018) and its Chinese translation (China Machine Press 2019). He has served as an IEEE Editor for the Communications Letters (Monthly Technical Journal) for a decade since 2001.

He had also served various Technical Conferences and Workshops as reviewer, organizers including Technical Program Chair of IEEE MILCOM 2011 (Baltimore, MD). Dr. Kim received his B.S. and M.S. from Seoul National University, Korea, and Ph.D. from University of Florida, Gainesville, FL, all from Electrical and Computer Engineering. Dr. Kim is an IEEE Life Senior Member (2017). Dr. Kim has served as the 39th President of KSEA, the 9th Chairman for Washington State Education and Culture Foundation (WSECF) and United Seattle-Bellevue Korean School (USBKS) Board of Directors. His lifetime achievements and contributions have been recognized through several awards, including The Republic of Korea Presidential Award (2008 대한민국 대통령 표창) and The Order of Civil Merits-Peony Medal (2018 대한민국 국민훈장 모란장).

2023 KSEA Awards

Jiwoong Park

Professor
Department of Chemistry
University of Chicago

Scientist of the Year Award

Dr. Jiwoong Park is a Professor (since '16) of the Department of Chemistry, Prizker School of Molecular Engineering, University of Chicago. He received his B.S. in Physics ('93) from Seoul National University and earned his Ph.D. in Physics, University of California at Berkeley ('03). Before joining the University of Chicago, he served as an Assistant and Associate Professor at the Cornell University ('06-'16).

Prof. Park research focuses on the development of wafer-scale atomically thin materials and their engineered van der Waals heterostructures. Over the past decades, Dr. Park has remained one of the most creative and influential researcher and developed transdisciplinary approaches that are scalable, precise, and innovative. He has demonstrated the development of 2D van der Waals crystals and molecular structures into real, large-scale materials thar have potential for use in future electronic, thermal, energy, and quantum applications.

Prof. Park is a highly productive and well-recognized researcher and educator. He published over 101 journal papers including 9 Nature and 7 Science articles and received 7 patents. He was elected as an American Physical Society Fellow ('22) and received NSF Career award, NSF Presidential Early Career Award for Scientists and Engineers (PECASE), and Alfred P. Sloan Research Fellowship. He has received more than $16 million in research funds from various funding agencies such as DOE, NSF, and AFOSR.

Jaehong Kim

Henry P. Becton Sr. Professor of Engineering

Department of Chemical and Environmental Engineering
Yale University

Engineer of the Year award

Dr. Jaehong Kim is Henry P. Becton Sr. Professor of Engineering at Yale University. He previously served as the chair of the Department of Chemical and Environmental Engineering at Yale from 2016 to 2022. He received his B.S. and M.S. degrees in Chemical & Biological Engineering from Seoul National University in 1995 and 1997, respectively. He earned his Ph.D. in Environmental Engineering from the University of Illinois at Urbana-Champaign in 2002. Prior to joining Yale, he was a professor in School of Civil and Environmental Engineering at Georgia Tech (2002-2013).

Prof. Kim is a pioneer of several highly innovative research subjects that contributed to opening new research areas within the field of water treatment. His research primarily focuses on developing next-generation technologies to remove or inactivate pathogens and degrade harmful organic pollutants through photo/electro-catalytic advanced oxidation and photochemical/photothermal solar water disinfection, employing advanced materials such as nanomaterials and single-atom catalysts.

He is a distinguished leader in environmental nanotechnology who demonstrates inclusive leadership. He is a recipient of various awards for both teaching and research, including Ackerman Award for Teaching and Mentoring from Yale University (2017), Bill Shultz Junior Faculty Teaching Award from School of Civil and Environmental Engineering (2013), Walter J. Weber, Jr. Frontier in Research Award from Association of Environmental Engineering and Science Professors (2023), Walter L. Huber Civil Engineering Research Prize from American Society of Civil Engineers (2013), and Paul L. Busch Award from Water Environment Research Foundation (2009). He received Best Paper Award from American Chemical Society three times (2012, 2018, 2020), and most recently in 2022, was recognized as Clarivate Web of Science Highly Cited Researcher.

Kevin Kim

CEO
Brave Turtles, Inc.

Entrepreneur of the Year Award

Mr. Kim is the current CEO of the Brave Turtles, Inc. (established in 2015) since 2021 and the President of SoCal K-Group in Los Angeles since 2018. He received his BA in Digital Media Fine Arts at OTIS, Los Angeles, CA. Mr. Kim started his career as a visual artist, and now flourishes his artistic career into a metaverse platform of business. After he joined as CEO in 2021, Brave Turtles launched RUNWAY Z in the metaverse platform with 60 million user visits within 6 months. Under his visionary leadership since then, the company has expanded its market value of more than $14M evaluation with a rapid growth in a metaverse platform.

Prior to his joining at Brave Turtles, he has experienced 19 years in the visual art entertainment business. Notably, he was one of Visual Effects (VFX) Oscar winning team in 2012 for Hugo and 2012 VFX Emmy winning team of Game of Thrones Season 2, while he worked at Pixomondo from 2011 to 2013. His team was nominated for 2013 VFX Oscar for Star Trek into Darkness, which involved 18 game cinematics such as Dragon age and the Force Unleashed 2.

Mr. Kim is an accomplished entrepreneur with a strong technical background in visual effects and gaming industry. He has also been involved in various community and cultural activities for Korean Americans.

재단법인 씨젠의료재단
Seegene Medical Foundation

Distinguished Sponsor Membership (DSpM)

Seegene Medical Foundation (SMF) is a large independent reference laboratory in South Korea. The testing center headquarters is located in Seoul, and there are four regional centers. SMF provides over 4,500 testing services, including routine laboratory tests, molecular tests, pathological diagnosis, and clinical research, to clinics and hospitals nationwide. SMF performs approximately 400,000 tests daily.

SMF operates the largest molecular diagnostic test center in South Korea. Its systems are capable of performing 400,000 automated COVID-19 tests per day. SMF has tested over 63 million people for COVID-19 since 2020, making it the largest testing center in Korea. SMF played a pivotal role in Korea's successful quarantine program.

SMF is exploring diagnostic values through several research institutes, including the Immune Research Institute, the R&D Center for Clinical Mass Spectrometry, the Molecular Diagnostic Research Center and AI Research Center. SMF has a grand vision to be the leader in digital healthcare by leveraging big diagnostic data populated from its in vitro diagnostics services.

SMF is promoting overseas expansion specifically in the United States, Europe, Southeast Asia, and Central Asia. In particular, SMF plans to diagnose and prevent diseases through IT-based digital healthcare services, and even provide treatment services.

The Seegene Medical Foundation contributes to human health and welfare through accurate diagnostic testing, social contribution and innovative research.

2023 KSEA Young Investigator Grant

Changrim Lee

Postdoctoral Research Fellow
Department of Ophthalmology at Harvard Medical School
Schepens Eye Research Institute of Massachusetts Eye and Ear Infirmary

2023 KSEA YIG Award in Science

Dr. Changrim Lee is a postdoctoral research fellow in the department of Ophthalmology at Harvard Medical School and Schepens Eye Research Institute of Massachusetts Eye and Ear Infirmary. He received his B.S. in Chemistry and M.S. in Biochemistry from Yonsei University in 2011 and 2014, respectively, and earned his Ph.D. in Pharmacology and Pharmaceutical Sciences from the University of Southern California in 2020, under the supervision of Professors Andrew MacKay and Sarah Hamm-Alvarez.

Dr. Lee's research interest lies at the interface of molecular/cellular biology, protein chemistry, polymer biophysics, and drug delivery technologies. His Ph.D. work focused on fundamental aspects of nanoparticle-mediated delivery of small and macromolecules and their pharmacology in vitro and in vivo.

He currently focuses on the biology of conjunctival epithelium and ocular surface health, and studies conjunctival biology and ocular surface pathophysiology in epigenomics, intracellular, extracellular, and pharmacology aspects.

Dr. Lee is the recipient of NIH T32 Kirschstein Institutional National Research Service Award from 2022 through 2023 and was awarded University of Southern California Provost Fellowship from 2014 through 2016. He received several awards including Hanmi-KASBP Fellowship Award of Korean American Society in Biotech and Pharmaceuticals and Outstanding Predoctoral Research Award of Association of Korean Neuroscientists, both in 2022. So far, he has published 8 journal papers in prestigious journals, 6 papers among which he is the first author for. His publications have received over 89 citations with an h-index of 6.

With the KSEA Young Investigator Grant, Dr. Lee will investigate "*Sex difference in the profile of extracellular bioactive lipids of conjunctival epithelial cells during allergic inflammation*" and the successful execution of this proposal will provide new insights into the bioactive lipid-mediated ocular surface protective mechanism generated by the conjunctiva and the basis for a tailored sex-dependent, lipid-based therapeutic approach in the management of vision-debilitating ocular surface diseases.

2023 KSEA Young Investigator Grant

Hyoyoung Jeong

Assistant Professor
Department of
Electrical and Computer Engineering
University of California, Davis
Affiliated Faculty at the Center for
Neuroengineering & Medicine

2023 KSEA YIG Award in Engineering

Dr. Hyoyoung Jeong is an assistant professor in the department of electrical and computer engineering at the University of California, Davis, and affiliated faculty at the Center for Neuroengineering & Medicine. He received his B.S. in Biomedical Engineering from Yonsei University in 2008 and M.S. in Bioengineering from Seoul National University in 2010. He completed his Ph.D. at the University of Texas at Austin department of Electrical and Computer Engineering (UT ECE), supervised by Prof. Nanshu Lu, where he developed a wireless stretchable electronic tattoo (e-tattoo) and unconventional freeform manufacturing schemes for flexible thin film wearable devices.

Before joining UT ECE for his Ph.D., he worked for Samsung Advanced Institute of Technology for 5 years as a researcher and developer in the advanced smartphone hardware group and mobile healthcare group. His work as a postdoctoral scholar with Professor John Rogers focused on the development and characterization of wireless soft wearable platforms for measuring and analyzing multimodal clinical-grade bio potentials. Currently, he focuses on personalized closed-loop wearable bio-electronics for health monitoring, diagnostics, and therapeutics.

Dr. Jeong received several awards, including the Engineering PhD Summit Award from École polytechnique fédérale de Lausanne (EPFL), Switzerland. He was the recipient of the 15th and 24th Samsung Humantech Paper Awards from Samsung Electronics Co. So far, he has published more than 30 journal papers in prestigious journals, including Science and multiple Science Advances and PNAS, as a leading author. His publications have received over 1800 citations with an h-index of 21. He has received 17 patents (8 pending) and has been invited to give more than 30 talks related to his research area.

With the KSEA Young Investigator Grant, Dr. Jeong will investigate "*Skin-interfaced wireless device for intrapartum fetal and maternal monitoring to minimize unnecessary C-section*," with an aim to research and develop the technology for an integrated monitoring platform leveraging advanced flexible electronics, wireless connectivity, and compatibility with a wide range of low-cost mobile devices. His research will contribute to solving a health problem that touches virtually every family and can potentially make an impact on both outcomes and cost of childbirth.

Keynote Symposium Report

Physical Science and Engineering

Real Solutions to Real Problems Impacting Real People

August 3 _ Thursday _ 10:30am _ Enterprise Ballroom 1-4

Though the rapidly developing robotics and AI technologies are already having a major impact on our everyday lives, often times, we also see many research being conducted without much considerations on how these technologies will impact on our lives and society. AI and robotics can be powerful tools to solve real problems, but also have their own risks and hazards that can bring danger and potentially have a serious negative impact on our society. We would like to see what problems researchers are solving, who is affected by this and how they will impact our society. In this UKC 2023 Keynote Symposium, U.S. and Korean experts in robotics are invited to discuss how the current state of the art and future robotics and AI technologies may impact our everyday lives.

Chair

Dennis Hong

Director, RoMeLa Robotics & Mechanisms Laboratory

Professor, Mechanical & Aerospace Engineering, UCLA

Do Robots Need to Look Like Human?

In Hollywood, robots are often depicted in the humanoid form. Thus when we think of robots we naturally imagine humanoid robots. For robots to move around in a human environment and to do work using tools made for humans, it is natural to have robots that have the shape and size of a human. We have been developing humanoid robots at RoMeLa (Robotics & Mechanisms Laboratory) for more than a decade for fire fighting and disaster relief applications. However, such robots are still too slow, too unstable, too complex, too expensive, and too unsafe which prevent them to be used in real life situations. Do robots really need to look like human? We revisit this question and present some of the new exciting morphologies as solutions, discuss the creative process, and imagine our future with robots.

Dr. Dennis Hong is a Professor and the Founding Director of RoMeLa (Robotics & Mechanisms Laboratory) of the Mechanical & Aerospace Engineering Department at UCLA. His research focuses on robot locomotion and manipulation, autonomous vehicles and humanoid robots. His work has been featured on numerous national and international media. Washington Post magazine called Dr. Hong "*the Leonardo da Vinci of robots*." Dennis has been named to Popular Science's 8th annual "*Brilliant 10*", "*Forward Under 40*" by the University of Wisconsin-Madison Alumni Association, and also honored as "*Top 40 Under 40*" alumni by Purdue University. Hong's other past awards include the National Science Foundation's CAREER award, the SAE International's Ralph R. Teetor Educational Award, and the ASME Freudenstein / GM Young Investigator Award to name a few. Dr. Hong also actively leads student teams for various international robotics and design competitions winning numerous top prizes including the DARPA Urban Challenge where they won third place and the $500,000 prize, and the RoboCup, the international autonomous robot soccer competition where his team is now a five time World Champions in the Humanoid divisions and brought the Louis Vuitton Cup Best Humanoid Award to the United States for the very first time. Dr. Hong received his B.S. degree in Mechanical Engineering from the University of Wisconsin-Madison (1994), his M.S. and Ph.D. degrees in Mechanical Engineering from Purdue University (1999, 2002).

Paul Oh

Lincy Professor
Unmanned Aerial Systems
University of Nevada, Las Vegas (UNLV)

From Disaster Response to Consumer Robotics

The lines between consumer electronics and consumer robotics are blurry. For example, at the annual Consumer Electronics Show (CES) in Las Vegas, the list of robotics companies exhibits has grown to over 400. Furthermore driverless cars, drones, exo-skeletons, 3D printers and virtual-reality systems are examples of robots that have a consumer focus. This talk highlights observations of this phenomena. This is given in the context of an Age of Acceleration characterized by deep learning, cloud-computing, and artificial intelligence. The talk serves to suggest pathways for roboticists and their design and development endeavors.

Prof. Paul Oh is the founder and director of the Drones and Autonomous Systems Lab (DASL). Prior, he was in Drexel University's Mechanical Engineering Department from 2000-2014. He received mechanical engineering degrees from McGill (B. Eng 1989), Seoul National (M. Sc. 1992), and Columbia (PhD 1999) universities. He is a Fellow of NASA (2002), Naval Research Lab (2003), Boeing (2006) and ASME (2012). He received research (2004 NSF CAREER) and teaching (2005 SAE Ralph Teetor Award for Engineering Education Excellence) awards and authored over 150 publications and 3 books. From 2008-2010, he served as an NSF Program Director managing the robotics research portfolio. He has lead Teams DRC-Hubo, DRC-Hubo@UNLV and Avatar-Hubo for the 2012-2014, 2015, and 2018-2022 DARPA Robotics Challenges Semi-Finals, Finals, and Avatar XPrize respectively. He recently served as General Chair for IEEE IROS 2020 (IEEE Intelligent Robots and Systems) Conference which gathered over 25,000 online attendees.

Joohyung Kim

Associate Professor
Director of KIMLAB
Electrical and Computer Engineering
Mechanical Science and Engineering
University of Illinois Urbana-Champaign

Panelist: Joohyung Kim's research focuses on design and control for humanoid robots, system for motion learning in robot hardware, and safe human-robot interaction. He received BSE and Ph.D. degrees in Electrical Engineering and Computer Science (EECS) from Seoul National University, Korea, in 2001 and 2012. He was with Disney Research as a Research Scientist from 2013 to 2019. Prior to joining Disney, he was a postdoctoral fellow in the Robotics Institute at Carnegie Mellon University for DARPA Robotics Challenge in 2013. From 2009 to 2012, he was a Research Staff Member in Samsung Advanced Institute of Technology, Korea, developing biped walking controllers for humanoid robots.

Daniel Dongyuel Lee

Tisch University
Professor
Electrical and Computer Engineering
Cornell Tech

Panelist: Dr. Daniel Dongyuel Lee serves as Head of Global AI for Samsung Research. He received his B.A. in Physics from Harvard University and his Ph.D. in Condensed Matter Physics from the Massachusetts Institute of Technology. He was also a researcher at Bell Labs in the Theoretical Physics and Biological Computation departments. He is a Fellow of the IEEE and AAAI and has received the NSF CAREER award and the Lindback award for distinguished teaching. He was also a fellow of the Hebrew University Institute of Advanced Studies in Jerusalem, an affiliate of the Korea Advanced Institute of Science and Technology and organized the US-Japan National Academy of Engineering Frontiers of Engineering symposium and Neural Information Processing Systems (NeurIPS) conference. His group focuses on understanding general computational principles in biological systems and on applying that knowledge to build autonomous systems.

Mark Yim

Director of the GRASP Lab
Asa Whitney Professor
Mechanical Engineering
University of Pennsylvania

Panelist: Mark Yim established the oldest robotics research laboratory in the country in 1980. His research group focuses on hardware design. They have demonstrated robots ranging from a humanoid displayed at the Philadelphia Museum of Art to transforming robots that can change their shape to the smallest self-powered flying robot in the world. His current research focus includes reconfigurable truss robots that can help in search and rescue operations, swarms of small flying robots that can group into shapes that interact with humans and swarms of microscopic robots that can build structures. His other research interests include product design, robotic performance art, low-cost manipulation, in the search and rescue as well as healthcare applications. Honors include the Lindback Award for Distinguished Teaching (UPenn's highest teaching honor); induction to the National Academy of Inventors in 2018. He has over 50 patents issued (perhaps the most prominent patents are related to the video game vibration control which resulted in over US$100 million in litigation and settlements). He has started three companies, one in robotics, one medical device company and one focusing on thermal storage to reduce carbon impact. Prior to Penn, he spent ten years in industry including positions as Principal Scientist at the Palo Alto Research Center (formerly Xerox PARC) and Virtual Technologies, a virtual reality startup company before that. He received his PhD from Stanford University in Mechanical Engineering.

Physical Science and Engineering

Achieving Carbon Neutrality: Perspectives and Challenges

August 4 _ Friday _ 10:30am _ Enterprise Ballroom 1-4

Chair

Young-Shin Jun

Professor, Energy, Environmental and Chemical Engineering
Washington University in St. Louis

Tae-Hyuk Kwon

Dean, College of Natural Science
Professor, Department of Chemistry
Ulsan National Institute of Science & Technology (UNIST)

Jens Birkholzer

Senior Scientist and Director
Energy Geosciences
Earth and Environmental Sciences
Lawrence Berkeley National Laboratory (LBNL)

Climate change driven by greenhouse gas (GHG) emissions is the defining challenge of our time, encompassing not only rising temperatures but also extreme weather events and a range of other impacts. Its effects are global in scope and unprecedented in scale, and they will continue to worsen as global temperatures and GHG emissions increase. Achieving carbon neutrality or net-zero emissions by balancing GHG emissions with removals from the atmosphere is critical to slowing climate change and minimizing its impacts. The keynote symposium at the 2023 UKC discussed the importance of a scientific understanding of decarbonization technologies, their deployment, and related policy implementation in the timely achievement of carbon neutrality targets. The Symposium Chair Dr. Young-Shin Jun, Professor at Washington University in St. Louis, discussed carbon neutrality and decarbonization energy technology options to meet Net-Zero CO2 Emissions (NZE) by 2050. She also introduced her research group efforts on chemical controls of metal carbonation and geologic CO2 sequestration as climate-mitigation technology. Then, Dr. Jens Birkholzer, the Director of Energy Geosciences Division of the Lawrence Berkeley National Laboratory, deepen the discussion by offering a keynote speech on basin-scale pressure and geomechanical impacts on carbon capture and sequestration (CCS). He illustrated the perspectives of CCS implementation at industrial-scale. To highlight renewable energy technology options, via a keynote speech, Dr. Tae-Hyuk Kwon, the Dean of the College of Natural Science at Ulsan National Institute of Science & Technology, introduced a dye-sensitized photo-rechargeable battery that operates wirelessly by harnessing low-intensity indoor light. Then, he illuminated novel photo/sono active materials that can be used for energy recycling and carbon catalysis. The symposium emphasized that the climate crisis can only be addressed by an all hands on deck approach, pursuing negative CO2 emission along with development and implement of low to zero carbon emission energy technologies. It urges all scientists, engineers, and entrepreneurs to get involved in addressing the most critical global challenge, climate change.

Life Science and Engineering

Innovative Discoveries on Regenerative Medicine

August 3 _ Thursday _ 10:30am _ Enterprise Ballroom 5&6

The Regenerative Medicine session will consist of two speakers who have pioneered the field of stem cell-based regenerative therapy. The topics will cover current update on stem-cell based therapy for brain and cardiovascular diseases. Dr. Kwang-Soo Kim from McLean Hospital/Harvard Medical School will present how basic molecular can be translated into novel therapeutic approaches for Parkinson's disease. Prof. Kim's group was the first to apply human iPSC-derived cells to a patient with Parkinson's disease. Dr. Young-sup Yoon from Emory University/Yonsei University will present their development of using human induced pluripotent stem cells, directly reprogrammed cells and engineering technologies for translation of basic discovery to clinical therapy of cardiovascular diseases.

Chair

Youngsup Yoon

Bruce R Logue Professor
Director of Stem Cell Biology
School of Medicine
Emory University

Distinguished Professor
Yonsei University

Cardiovascular Regeneration using Stem Cells, Reprogrammed Cells and Engineering: Bench to Bedside

Ischemic cardiovascular disease is the most common health burden worldwide. The discovery of stem or progenitor cells has provided new hope for many patients with advanced diseases, because cell therapy could alleviate ischemia by forming new vessels. Over the last decade, two new developments have emerged for cell-based therapy for cardiovascular disease: human pluripotent stem cell-derived endothelial cells (ECs) and directly reprogrammed or induced endothelial cells. I will present the recent development on these two types of cells in terms of preclinical development. In addition, we have developed various bioengineering approaches to improve transplanted cell survival and function. We have also been working on simultaneous reprogramming of somatic cells into a tissue-like structure, referred to as reprogrammed cardiovascular tissue (rCVT), which includes ECs, smooth muscle cells, and cardiomyocyte. Implantation of this rCVT onto the infarcted mouse heart reduced regional cardiac strains and improved cardiac function via direct cellular contribution, paracrine effects, and scaffolding effects. These new approaches can serve as a novel platform for cell-based therapy and drug discovery.

Young-sup Yoon, MD, PhD is Bruce R Logue Chair Professor and Director of Stem Cell Biology at Emory University School of Medicine and Distinguished Professor at Yonsei University. His research focuses on cardiovascular regeneration with stem cells, direct reprogramming, and tissue engineering. He is one of the pioneers in using stem cells for cardiac and vascular regeneration. His research has been continuously funded by grants from NIH, Department of Defense, and American Heart Association since 2004. He was elected as prestigious member of American Society for Clinical Investigation as the first Korean. He is Fellow of American Heart Association, a chartered member of NIH study section, and a member of editorial boards of the journals including Circulation Research, Molecular and Cellular Biochemistry (Associate Editor), Frontiers in Drug Discovery (Associate Editor). He also founded a company for the first-in-class clinical trial with human iPSC-derived endothelial cells for cardiovascular regeneration through Karis Bio Inc.

Kwang-Soo Kim

Director
Molecular Neurobiology
Laboratory
McLean Hospital

Professor of Psychiatry
Harvard Medical School

Toward a Cure for Parkinson's Disease: From Bench to Bed and From Bed to Bench

Based on our studies of transcriptional regulatory cascade underlying development and maintenance of midbrain dopaminergic (mDA) neurons, we identified the orphan nuclear receptor Nurr1 as a promising therapeutic target of PD. Although Nurr1 was viewed as a ligand-independent, constitutively active transcription factor, we identified both synthetic and endogenous ligands of Nurr1 that prominently regulate Nurr1's function via direct interaction, suggesting that (1) Nurr1 is an "*adopted*" nuclear receptor (thus, "*druggable*") and (2) Nurr1's agonists can be developed as a novel class of mechanism-based, disease-modifying therapeutics for PD. In addition, given that major motor dysfunction of PD is caused by selective degeneration of midbrain dopamine neurons, cell replacement is a promising approach for PD. Thus, we are developing and optimizing human iPSC-based transplantation for autologous, personalized cell therapy and recently treated the first PD patient using the patient's own cells. At the same time, this clinical study revealed new challenges to be addressed. I will discuss how basic molecular studies can be translated into novel therapeutic approaches for PD and vice versa, demonstrating a proof-of-concept of "*bench to bed side*" and "*bed to bench*" approaches.

Kwang-Soo Kim, Ph.D. is a professor and Director of the Molecular Neurobiology Laboratory at McLean Hospital and Harvard Medical School. Based on his >30 years' experiences to investigate the transcriptional regulatory cascade of midbrain dopamine neuronal system, he has been focusing on translating his research to novel therapeutic development of Parkinson's disease (PD). In particular, he is focused on developing a novel neuroprotective drug as well as establishing an efficient platform for personalized autologous cell therapy of PD.

Life Science and Engineering

Innovative Discoveries on Brain Science

August 4 _ Friday _ 10:30am _ Enterprise Ballroom 5&6

Chair

Jin Mo Chung

Professor and Chair
Department of Neuro-biology
University of Texas Medical Branch

The Brain Science session will consist of three world renowned speakers covering a wide range of brain function spanning from newly discovered brain receptor function, to brain circuit connectivity, to a clinically applicable animal study. Dr. Uhtaek Oh from KIST will talk about the Physiological roles of a newly discovered mechanical sensing receptor in brain function. Dr. Jin Hyung Lee from Stanford University will then discuss how to solve brain circuit function and dysfunction with computational modeling and optogenetic imaging techniques. As an example of an animal study for a disease model, Dr. Jun-Ho La from University of Texas Medical Branch will discuss how chronic pain develops from non-chronic injuries in a sex-dependent manner in mice models of pain.

Co-Chair and Presenter

Uhtaek Oh

Principal Investigator and Director
Brain Science Institute
Korea Institute of Science and Technology (KIST)

Tentonins are mechanically activated channels required for essential functions

Mechanotransduction is a biological process of the conversion of mechanical stimuli into biological responses. Numerous physiological functions such as touch, pressure sensation, hearing, blood pressure sensing, proprioception, and pain require mechanotransduction. Mechanotransduction starts with mechanosensitive (MS) channels in many mechanosensory cells. In the present seminar, we will introduce a novel MS channel gene, Tentonin 3 (TTN3), that elicits MS currents with slow inactivation kinetics distinct from Piezo channels. How TTN3 is different from Piezo1 and 2 will be discussed. A piece of evidence that TTN3 is a bona-fide MS channel, not a regulator of Piezo1 will also be presented. Physiological roles of TTN3 in proprioception, baroreceptor function, and beta-cell functions in pancreas will be summarized.

Dr. Uhtaek Oh is a principal researcher and a former director of the Brain Science Institute of KIST. Before this, Dr. Oh had been a professor of Seoul National University for a long time. His main research field has been ion channels that are essential for numerous physiological functions. This research field requires heavy knowledge on electrophysiology as well as molecular biology. Luckily, Dr. Oh found two important ion channels, Anoctamin 1 and Tentonin 3. As the head of a neuroscience institute, Dr. Oh is also interested in recently developed technology in neuroscience, such as neurotools for studying complex circuits of the brain.

Jin Hyung Lee

Associate Professor
Neurology and
Neurological Sciences,
Bioengineering,
Neurosurgery, and
Electrical Engineering
(Courtesy)
Stanford University

Solving brain circuit function and dysfunction with computational modeling and optogenetic fMRI

Neurological and psychiatric disorders are dramatically increasing in prevalence due to aging population and social isolation. However, to date, there is no cure for any of the brain disorders. The goal of brain disorder treatments is to restore the brain's function. Therefore, a key challenge is to quantify the brain function underlying behavior. Once the brain function algorithms underlying behaviors of interest can be quantitatively defined, minimizing the normal and diseased brain function difference can be defined as the objective function for the brain disorder treatment. The variables then can be optimized to minimize the objective function. In order to quantify the brain function algorithms underlying behavior, cell type specific whole brain function measurements are necessary. We utilize optogenetics combined with fMRI (ofMRI) to enable such measurements. Through computational modeling of ofMRI data, the functional interactions among different regions of the brain was then quantified. In combination with electrophysiological measurements, we further model brain function at a cellular level. In order to further understand the circuit, pathology relationship, we also utilize brain clearing methods to longitudinally quantify and model pathology. Through these efforts, we aim to enable systematic design of therapeutic interventions necessary for the treatment of brain disorders.

Jin Hyung Lee, PhD is an Associate Professor of Neurology and Neurological Sciences, Bioengineering, Neurosurgery, and Electrical Engineering (Courtesy) at Stanford University. Dr. Lee received her Bachelor's degree from Seoul National University and Masters and Doctoral degree from Stanford University, all in Electrical Engineering. She is a recipient of the 2008 NIH/NIBIB K99/R00 Pathway to Independence Award, 2010 NIH Director's New Innovator Award, 2010 Okawa Foundation Research Grant Award, 2011 NSF CAREER Award, 2012 Alfred P. Sloan Research Fellowship, 2012 Epilepsy Therapy Project award, 2013 Alzheimer's Association New Investigator Award, 2014 IEEE EMBS BRAIN young investigator award, 2017 NIH/NIMH BRAIN grant award, and 2018 Lina 50+ Award Grand Prize, and 2019 NIH Director's Pioneer Award. As an Electrical Engineer by training with Neuroscience research interest, her goal is to analyze, debug, and engineer the brain circuit through innovative technology.

Jun-Ho La

Associate Professor
Department of
Neurobiology
University of Texas
Medical Branch (UTMB)

Sex differences in pain chronification

Acute injury-induced pain can transition to chronic pain (pain chronification) which predominantly affects women. To understand its mechanisms, we developed a new murine model of pain chronification in which postinjury stimulation of an acute injury area triggers pain chronification without affecting the resolution of the acute injury. Female mice have greater sensitivity and a wider timeframe for postinjury stimulation to trigger pain chronification. The resultant chronic pain state is maintained by ongoing nerve activity at the inciting injury area in females but by reactive spinal microglia in males. In the absence of estrogen, females develop pain chronification that is maintained by none of the two mechanisms. In males, spinal GABAergic disinhibition is critical for normally innocuous peripheral stimulation to activate spinal microglia. Unlike males, females develop pain chronification only when GABAB receptor-mediated spinal inhibition is impaired, which is not dependent on spinal microglia. These results suggest that treatments for pain chronification need the consideration of mechanistic sex differences.

Dr. La received his PhD in veterinary physiology from Seoul National University studying the mechanisms of intestinal dysmotility and visceral pain in a rat model of irritable bowel syndrome. During his postdoctoral training at Gyeongsang National University, he investigated the functional expression of two-pore domain (K2P) channels in dorsal root ganglion (DRG) neurons. As a postdoctoral associate and Research Assistant Professor at the University of Pittsburgh, Dr. La studied long-term changes in DRG neurons in visceral pain conditions. Currently, at UTMB, his research focuses on mechanisms of pain chronification without underlying persistent tissue injury.

Computational Science and Engineering:

Advances in Quantum and High Performance Computing

August 3 _ Thursday _ 10:30am _ Enterprise Ballroom 7&8

High performance computing is at the heart of modern technology, enabling computational sciences, artificial intelligence and information technology. Customized computational resources are deployed in hybrid high performance computing environments to support optimized execution of critical tasks. Quantum computers provide a promise for tackling challenging problems that are intractable using conventional computational capabilities. This symposium will discuss advances in high performance computing, and explore the future trends enabled by quantum computing in hybrid HPC environment.

Chair

Jungsang Kim

Schiciano Family
Distinguished
Professor
Electrical and Computer
Engineering and Physics
Duke University
Co-Founder and CTO
IonQ

Jungsang Kim is the Schiciano Family Distinguished Professor of Electrical and Computer Engineering and Physics at Duke University, and a Co- Founder and Chief Technology Officer of IonQ, Inc. Kim has pioneered the technology development, system engineering and commercialization of quantum computers based on trapped atomic ions, by leading numerous multi-disciplinary collaborative research initiatives in the US. Prior to Duke University, Kim was a Member of Technical Staff and Technical Manager at Bell Laboratories, leading the development and commercialization of large- scale optical switches and wireless communication systems. He received his Ph.D. degree in Physics from Stanford University (1999) and BS degree in Physics from Seoul National University (1992). He is a Fellow of the American Physical Society and Optica (formerly Optical Society of America).

Quantum Computers: Applications and Implementations

Quantum computers exploit the bizarre features of quantum physics - uncertainty, entanglement, and measurement - to perform tasks that are impossible using conventional means, such as computing over huge amounts of information, and communicating via teleportation. I will summarize the foundations of quantum computation and the potential exponential scaling quantum computers may hold over conventional computation, along with some examples of quantum speedups based on the parallelism of quantum superposition. I will conclude with a summary of the leading quantum computer architectures, particularly those based on individual atoms, suspended and isolated with electric fields, and individually addressed with laser beams. Ion trap quantum computers have essentially perfect idle qubit/spin coherence properties with fully-connected and reconfigurable entanglement operations. I will present recent results with state-of-the-art ion trap quantum computer systems and simulators, from both the Duke Quantum Center and IonQ, Inc., and summarize the outlook for further scaling of ion trap quantum computers based on a well-defined and modular architecture.

Christopher Monroe

Gilhuly Family
Presidential
Distinguished Professor
Electrical and Computer
Engineering and
Physics
Duke University
Co-Founder and Chief
Scientist
IonQ, Inc.

Christopher Monroe is the Gilhuly Family Presidential Distinguished Professor of Electrical and Computer Engineering and Physics at Duke University, and the Co-Founder and Chief Scientist of IonQ, Inc. Monroe has pioneered nearly all aspects of trapped ion quantum computing and simulation, from the demonstration of the first quantum gate, a monolithic semiconductor chip ion trap, and photonic interconnections between separated ion trap systems. He is a key architect of the US National Quantum Initiative, a Fellow of the American Physical Society, Optical Society of America, the UK Institute of Physics, the American Association for the Advancement of Science, and is a member of the National Academy of Sciences.

Jaejin Lee

Dean
Graduate School of
Data Science

Professor
Department of
Computer Science and
Engineering

Seoul National
University

Quantum Computing, Deep Learning, and Accelerated Computing

The deep learning language models, which have recently been in the limelight, require supercomputer-level computing resources that are made up of hundreds or thousands of GPU computer systems when training. Quantum computing is a fundamentally different computing paradigm and is seen as a future option to solve the intractable problems of classical computing using digital computers. However, current quantum computers are still noisy and error-prone, so classical simulation of quantum circuits is essential for the verification of quantum computers and the development of complex quantum algorithms. Classical simulations of large quantum systems mainly use supercomputers because they require exponential memory space and computational complexity depending on the number of qubits. Accelerated computing is a method of mixing a traditional CPU with an accelerator. It is a computing model that reduces computing time by accelerating a specific task in a special processor called an accelerator. Currently, GPUs, FPGAs, and NPUs are mainly used as accelerators. This talk examines the relationship between quantum computing, deep learning, and accelerated computing, and discusses the desirable research direction from the software point of view.

Jaejin Lee is the Dean of Graduate School of Data Science and Professor at the Dept. of Computer Science and Engineering at Seoul National University (SNU). He also serves as the Director of the Center for Optimizing Hyperscale AI Models and Platforms and the Thunder research group at SNU. He received his Ph.D. degree in Computer Science from the University of Illinois at Urbana-Champaign (UIUC) in 1999. He received an MS degree in Computer Science from Stanford University in 1995 and a BS degree in Physics from SNU in 1991. After obtaining the Ph.D. degree, he spent half a year at UIUC as a visiting lecturer and postdoctoral research associate. He was an assistant professor in the Department of Computer Science and Engineering at Michigan State University from January 2000 to August 2002 before joining SNU. He is an IEEE fellow.

Alexander (Lex) Kemper

Associate Professor
Department of Physics
North Carolina State
University

Opportunities for Quantum/Classical Computing

Quantum computing has the potential to help us overcome the barriers that are presented by the end of Moore's law. In the natural sciences, these barriers appear as limitations in computer memory and/or processing speed which prevent scientists from describing the problem fully and forcing them to work on smaller models or with approximate methods. Since nature is fundamentally quantum, it is quite natural to view a quantum computer as a bespoke quantum simulator, where we can examine the open problems in science at a scale not possible with classical computers. In this talk, I will present how this is achieved, discuss some recent advances in the area. In addition, I will discuss the limitations of quantum computing, and where classical computing can play an important role, for both today's quantum hardware and going into the fault-tolerant quantum era.

Lex Kemper is an associate professor in the Department of Physics at North Carolina State University. His work centers at the intersection of quantum computing and condensed matter physics, where his group is studying how near- and future-term quantum computers could be of use in solving outstanding problems in physics. He received his Ph.D in Physics from the University of Florida in 1999, following a BS degree in Physics and Mathematics from the same institution. After obtaining his Ph.D., he spent 2 years at Stanford as a postdoctoral research associate, and 3 years at Lawrence Berkeley National Laboratory as an Alvarez Fellow before joining NC State.

Computational Science and Engineering:

Artificial Intelligence (AI) and Cybersecurity

August 4 _ Friday _ 10:30am _ Enterprise Ballroom 7&8

Chair

Tae (Tom) Oh

Professor- iSchool
Golisano College
of Computing and
Information Sciences
Strategic Initiatives and
Innovation Director
National Technical
Institute of Deaf
Rochester Institute of
Technology (RIT)

The impact of the industrial and digital (information) revolutions has, undoubtedly, been a substantial advancement in our industry, social media, and e-commerce. In addition, AI and cybersecurity have impacted extensive changes and breakthroughs affecting all aspects of our society and life. This results in a richly interconnected organization with decision-making using machine learning and exploiting "*big*" data in a safe and secure environment. Now, consumers can buy goods, and businesses can obtain services from anywhere in the world using the Internet and exploiting the unlimited possibilities using the widespread usage of AI and cybersecurity inventions. The highly selected speakers will share their perspectives on AI and cybersecurity advancements, research, industry, and challenges in this session. Also, they will share the future trends in their area of expertise.

Tae Hyun Hwang

Endowed Chair
Florida
Dept. of Cancer Biology
Mayo Clinic
Comprehensive
Cancer Center

Unraveling Cancer's Complexity: Single-Cell and Spatial Genomics Meet Machine Learning and AI for Personalized Immunotherapies and Cellular Therapies

In this talk, we will delve into how single-cell and spatial genomics, combined with machine learning and AI, can revolutionize biomarker identification and the development of personalized immunotherapies for cancer treatment. By analyzing sequential single-cell CAR-T and PBMC data from CD19 CAR-T cell treated patients, we aim to uncover novel biomarkers and combinatory therapies. Additionally, we will discuss AI-guided biomarker discovery and therapeutic strategies specifically tailored for gastric cancer immunotherapy, ultimately paving the way for more targeted and effective treatments in the rapidly evolving field of oncology.

Dr. Tae Hyun Hwang is a renowned researcher in cancer, holding the prestigious position of Endowed Chair at Mayo Clinic Florida. Focusing on using artificial intelligence (AI) and advanced computing techniques to improve patient outcomes, Dr. Hwang works closely with top healthcare institutions and businesses, including pharmaceutical companies and start-ups, to develop innovative solutions for complex medical challenges. With a strong background in both computer science and medicine, Dr. Hwang's work bridges the gap between these fields, enabling the development of cutting-edge treatments for cancer and heart diseases. In addition to his work at Mayo Clinic, Dr. Hwang has held positions at several prestigious institutions, such as Cleveland Clinic and the University of Texas Southwestern Medical Center. He also leads a team of 20 researchers at the ML and AI Lab, where they work together to advance the use of AI and machine learning in medical research. As a testament to his innovative approach, Dr. Hwang co-founded KURE.AI and KURE.AI Therapeutics, a clinical stage cellular therapy company that develops personalized cell therapy products using AI technology.

Minkyong Kim

Engineering Director
Artificial Intelligence
Machine Learning
Apple

AI Voice Assistants in Industry: Past, Present, and Future.

Voice assistants have become increasingly popular in recent years. These devices use a combination of speech recognition, natural language understanding, and dialogue management to understand and respond to user requests. However, there are still challenges to be addressed before voice assistants can reach their full potential. These challenges include ensuring the safety of generated responses, optimizing for on-device processing, and better understanding how people interact with voice assistants. This talk provides a comprehensive overview of the past and present as well as the challenges and opportunities that voice assistants face in the future.

Minkyong is Engineering Director at Apple, focusing on Siri Voice Assistant. Before joining Apple, she worked as VP at Samsung Electronics in Korea, leading the development of Bixby Voice Assistant for smart appliances. She also worked as the chief coordinating officer for Samsung Global AI Centers. Before that, she worked at IBM T.J. Watson Research Center in New York for ten years focusing on the design and development of IBM Cloud, Messaging Systems, and Stream Processing. She received her Ph.D. in Computer Science and Engineering from the University of Michigan and her M.S. and B.S. in Computer Science and Engineering from Seoul National University. She holds 40+ patents and published 30+ papers at top conferences and journals.

Jeremy Epstein

Program Director
Secure and Trustworthy Cyberspace (SaTC) Lead
Division of Computer and Network Systems (CISE/CNS)
National Science Foundation (NSF)

Cybersecurity Research – Yesterday, Today, and Tomorrow

Cybersecurity and privacy are no longer just technical topics, if they ever were. In the early days, cybersecurity meant encryption, and was closely tied to mathematics. Over the intervening decades, it was mostly confined to computer science. Today, it covers computer science and computer engineering, but also many areas in social sciences, ethics, education, mathematics, statistics, law, policy, business, and even biological sciences. Some even argue that it impacts the arts. The National Science Foundation is undergoing a rethinking of the cybersecurity & privacy field, and how research should be supported and funded for the next decade. Simultaneously, the White House's interagency research coordinating group, Networking and Information Technology Research & Development National Coordinating Office, is working on a rethinking of the Congressionally-mandated Federal Cybersecurity Research Strategy. And in March 2023, the White House Office of the National Cyber Director released the National Cybersecurity Strategy, which includes a section on cybersecurity & privacy research. This talk will bring together these threads of US government activity to describe how government-funded cybersecurity & privacy research will evolve over the next decade, and how they may impact non-governmental research.

Jeremy Epstein leads the National Science Foundation's Secure and Trustworthy Cyberspace (SaTC) program, NSF's flagship multi-disciplinary cybersecurity research effort. Over the past decade, SaTC has sponsored nearly 4000 research projects and almost $1B in spending, and is currently revisiting its mission to focus on the next decade. In addition to leading the SaTC program, Jeremy co-leads the US government's interagency research program for cybersecurity through the Networking and Information Technology Research & Development Cybersecurity & Information Assurance Interagency Working Group (NITRD CSIA IWG), where he is responsible for the National Cybersecurity Research Strategy. His research interests include securing voting and elections. In addition to his work at NSF, he is chair of the Association for Computing Machinery's US Technology Policy Committee (ACM USTPC), a non-partisan scientific expert group providing technical advice on a wide range of computing policy issues. He is also founder and director of the Scholarships for Women Studying Information Security (SWSIS) program.

Workforce of the Future: Education and Careers

Convergence in Education and Workforce Development

August 3 _ Thursday _ 10:30am _ Room Maverick

Chair

Gloria J. Kim

Department of
Engineering Education
University of Florida

Powerful technologies, such as artificial intelligence, automation, robotics, and the internet of things, are disrupting the nature of work and reshaping the landscape of jobs. New forms of learning, skills assessments, and job training are exposing pitfalls of traditional degree-centric requirements in tech hiring. The approach to developing and sustaining talent supply chain must change. This UKC 2023 Keynote Symposium explores convergent perspectives on education and workforce development. Experts and stakeholders are invited to offer insights on how the benefits of emerging technology can be leveraged to equitably impact current and future workforce.

Topical Plenary

Curtis J. Bonk

Professor, School of
Education
Indiana University
2022 American
Educational Research
Association (AERA)
Fellow

Technology Today, Technology Tomorrow: Might Learning Evolutions lead to Learning Revolutions?

Change is inevitable. Technology change is pervasive. Yesterday's technologies wiped entire industries and occupations. Today's technologies are accelerating these changes, and are, in particular, transforming the field of education. Learning is definitely changing. Generative AI has accelerated everything. There is now a pervasive need for innovations in how we teach and how we learn. In response, Professor Bonk will detail a set of 20 "*last*" principles of instruction including (i.e., flexibility, autonomy, meaningful learning, choice, etc.) and he will also highlight new roles for instructors in light of these principles. Next, he will discuss these in light of three megatrends related to learning technology today: (1) the technologies for engagement; (2) the technologies for pervasive access; and (3) the technologies for the personalization and customization of learning. In the third decade of the 21st century, learning has become increasingly flipped, social, collaborative, global, game-like, mobile, modifiable, open, online, visually-based, hands-on, ubiquitous, personal, and much much more. Is this an evolution or a revolution?

Curtis J. Bonk is Professor in the School of Education at Indiana University (IU) teaching psychology and technology courses and Adjunct in the School of Informatics at IU. He is a former software entrepreneur, certified public accountant, corporate controller, and educational psychologist who presently is an educational technologist, award-winning writer, highly published researcher, statewide and national awardee in innovative teaching with technology, and internationally acclaimed presenter. Curt is the author of nearly 400 publications and has given close to 2,000 talks around the world. In 2020, Curt was awarded the IU President's Award for Excellence in Teaching and Learning Technology and in 2021, he received the David H. Jonassen Excellence in Research Award. Recently, the American Educational Research Association named him a 2022 AERA Fellow for his exceptional contributions to, and excellence in, education research, and in 2023 AERA recognized him with the Outstanding International Research Collaboration Award for his joint research with Professor Min Young Doo at Kangwon National University in Korea. Curt co-hosts the weekly award-winning podcast show, Silver Lining for Learning (https://silverliningforlearning.org/). He can be contacted at cjbonk@indiana.edu and his homepage is http://curtbonk.com/.

Wookyung Sun

Visiting Professor
Dept. of Electrical and Computer Engineering
Seoul National University

100,000 by 2026: The COSS Project

The high-tech innovation convergence university project (COSS: Convergence and Open sharing System) is a project that breaks down the boundaries between universities and transcends the walls between departments, enabling any student to pursue education in their desired cutting-edge field irrespective of their major. The goal of this project is to foster 100,000 skilled students in the digital high-tech field by 2026, based on the principles of convergence, openness, and cooperation. The consortium in 13 fields is composed of universities and colleges nationwide. The project is scheduled to run for a period of 6 years, with the government supporting the project cost of 9 million dollars per consortium. In this talk, we will introduce specific details about the COSS project and discuss how the Korean government approaches education to foster future talents in preparation for the Fourth Industrial Revolution.

Dr. Wookyung Sun is currently participating in various human resource development programs related to the next-generation semiconductor industry at Seoul National University in Korea. She worked at HYNIX Semiconductor Inc. research center for ten years, focusing on the cell transistor design and process integration of DRAM. She received her B.S., M.S., and Ph.D. in electronics engineering from Ewha Womans University in Seoul, Korea. Her current research interests include memristor devices for neuromorphic engineering and spiking neural network algorithm modeling.

Junseok Hwang

Professor of Information Science and Technology
Technology Management, Economics, and Policy Program (TEMEP)
Seoul National University

Smart City Education and Training

Prof. Hwang received his Ph. D. in Information Science and Telecommunications from the University of Pittsburgh, a. He began his academic career as an Assistant Professor in the School of Information Studies at Syracuse University. He is the Director of Global R&DB Center, International Technology Professional Program (ITPP), ASEAN Smart City Professional Program, and Transdisciplinary Graduate Program in Smart City Global Convergence (SCGC) at Seoul National University. He has educated and advised more than 200 post graduate government officials, public researchers, academic and industry leaders from about 50 countries as global leaders of ICT innovation and smart city development. Along with the world-wide network of Technology Management, Economics and Policy Program (TEMEP), International Technology Professional Program (ITPP) and Smart City Global Convergence Program (SCGC), he hosts annual International Symposia on Green, Smart, Development and Vision (GSDV) to exhibit transdisciplinary ICT innovation research and practices as a part of global knowledge sharing and collaboration. Currently, he is leading the national funded BK21 program, Smart City Global Convergence (SCGC) Program in SNU as a program director with the dedicated mission of educating international technology specialists and smart city experts from around the globe. His current research focuses on economics of information and networks, management and policy of convergence technologies, social impact study and forecasting of emerging technologies, knowledge and intelligence management. Recent research areas also include smart city technology innovation, sustainability of technology management, appropriate technology for developing economy and community, fourth industrial revolution education, digital transformation.

Charles G. Woychik

Senior Director of Advanced Packaging Platforms
SkyWater Technology

Developing the Talent of the Future through Partnerships

Dr. Charles G. Woychik is Senior Director of Advanced Packaging Platforms at SkyWater Technology in Kissimmee, FL. Prior to joining SkyWater he was the Chief Scientist at i3 Microsystems in St. Petersburg, FL. Other previous positions that he held were: Senior Director of 3D Technologies at Invensas Corporation and Senior Scientist at GE Global Research Center. Most of his career was at IBM Endicott, NY where he held both engineering and managerial positions. His area of expertise is materials and processes for advanced electronics packaging. He holds a Doctorate and Master of Science degree in Materials Science and Engineering from Carnegie-Mellon University. He has a Bachelor of Science degree in Metallurgical Engineering from the University of Wisconsin-Madison. Chuck has presented at numerous conferences and has many publications. He has 123 issued US issued patents to his credit.

Workforce of the Future: Education and Careers

Future Careers in Technology and Entrepreneurship

August 4 _ Friday _ 10:30am _ Room Maverick

The job market, particularly in technology, is constantly evolving with changes such as hybrid remote work, job automation by artificial intelligence, and increasing interests in entrepreneurship and startups. To succeed in the future job market, individuals must stay up to date and adapt to new technologies and the market environment. This keynote symposium targets mid-career and young professionals, as well as the young generation. It will feature speakers discussing future careers in technology and entrepreneurship, how to acquire new job skills, advance in corporate careers, or start a company. The symposium will culminate in a speaker panel session with an open discussion and Q&A.

Chair

Kyeong Ho Yang

Founder & President
Korean-American Innovative Technology Engineers and Entrepreneurs (KITEE)

Kyeong Ho Yang is a technologist and innovator in the fields of video processing, multimedia communication systems, and data science. He has nearly 30 years of R&D experience at companies of various sizes from startups to large R&D labs like Bell Laboratories. He has published over 50 papers in peer-reviewed journals and conferences and holds 40 U.S. patents. He is also an entrepreneur who co-founded multiple technology companies in multimedia communications, mobile apps, and EdTech. Recent years, he has been very actively advising Korean startup CEOs through KITEE that he founded in 2015. He has also led the entrepreneurship activities in the Korean-American Scientists and Engineers Association (KSEA), serving as the founding Chair of the KSEA STEP-UP Conference (2020 and 2021) and Chair of the Innovation & Entrepreneurship Symposium at the US-Korea Conference (Co-Chair in 2019 and 2020, Chair in 2021 and 2022), among others. Through these R&D and entrepreneurship activities, Dr. Yang has successfully established strong relationships with people in various areas including academia, industry, startups, business, and government agencies. He received his B.E., M.S., and Ph.D. degrees, all in Electronics Engineering, from Seoul National University.

Co-Chair

Benjamin Lee

Senior Research Associate
Weill Cornell Medicine

Benjamin C. Lee is a Senior Research Associate in Radiology at Weill Cornell Medicine (WCM). His current research involves developing machine learning algorithms for cardiovascular medical imaging in CT, Echo, ECG, and histopathology data for heart failure, heart transplantation, and coronary plaque characterization. Prior to working at WCM, he was a research scientist in industry for over 10 years at INVIA Medical Imaging Solutions in Michigan researching advanced algorithms for the 4DM nuclear medicine (PET, SPECT) cardiac quantification software. His research interests also include biomedical image segmentation, motion correction, image coregistration, kinetic analysis, and inverse problems. For KSEA, he has also helped lead and organize the Data Science Workshop at UKC for the past 5 years, was the Michigan Chapter President and a TG Councilor and chaired national Young Generation conferences. He received both his Ph.D. and M.S. at the University of Michigan, Ann Arbor in Electrical Engineering and his B.S. from Cornell University.

Stella H. Kim

Chief Marketing Officer
& Global VP
Head of Executive
Search
HRCap, Inc.

Future of Work and Career Development

This talk first reviews the evolving job market, particularly in technology, with changes such as hybrid work, job automation, glocalization, and new technologies and vast amounts of information that become available at workplaces. Then, Stella will guide next-gen leaders on how to build greater self-awareness and learning agility to succeed in the future job market. She will also speak on the importance of proactively taking accountability, reskilling and upskilling, and serving as a multigenerational and multicultural bridge. She will finally touch on key topics of professional development, job transitions, and career changes.

Stella H. Kim is a 1.5 generation Korean-American talent executive, modern HR leader, and change agent. Stella is an official Forbes HR Council member and Chief Marketing Officer at HRCap, Inc., the largest Asian-American Executive Search & Total HR Solutions Provider. Formerly, she was a Talent Analytics Specialist and Senior Strategy & Analytics Consultant at IBM. Stella is an expert in identifying capability gaps and unlocking opportunities to empower greater potential in individuals, organizations, and communities. She aids decision making with a data-driven macro-view of the labor economy while driving deep empathy with a social-organizational micro-approach. Stella holds a Bachelor's degree in Economics from Princeton University and a Master's degree in Social-Organizational Psychology from Columbia University.

Chang Kim

Former CEO and
Founder of Tapas Media

Career as an Entrepreneur and Careers at Startups

This talk explores the world of entrepreneurship and sheds light on the journey of founding and exiting a startup. Chang Kim ("CK"), the founder of Tapas Media, will share his experience as an entrepreneur with the audience, discussing the challenges and rewards of starting your own business, and the skills and experience you need to be successful. CK will also talk about the diverse roles and responsibilities available at startups and the opportunities for growth and development that these companies can offer. Join us to gain practical knowledge and a deeper understanding of the entrepreneurial landscape.

Chang Kim ("CK") is a 2x founder and angel investor/adviser for 50+ companies. CK is the original founder and former CEO of Tapas Media, a mobile storytelling platform and community for original IP creators in the US. In 2021, Tapas Media was acquired by Korea's Kakao Entertainment at a $510M valuation. Prior to this, he was a product manager at Google, running Blogger. He joined Google when it acquired TNC, a leading blogging software company in Asia that he co-founded. Before TNC, CK was at Samsung, in charge of Samsung's mobile content strategies. He has a B.S. degree in Physics from the University of Michigan and also studied at Seoul National University.

Anna Ji-Hyun Lee

Director
Prellis Biologics

Panelist: Anna Lee is the Director of Antibody Screening at Prellis Biologics. She joins Prellis with extensive experience in platform development for antibody discovery, having worked for several leading biotech and pharmaceutical companies such as the U.S. Military HIV Research Program, Regeneron, Bristol-Myers Squibb, and IGM Biosciences. She holds an undergraduate degree from the University of Virginia, where she pursued studies in Chemistry and Bioethics, and Master's degrees in Chemistry and Bioinformatics from Villanova and Johns Hopkins University.

Technical Symposium Report

Technical Symposium Group

Technical Group A-1	**Physics (PHY)**	Chair: Harold D. Kim (Georgia Institute of Technology) Co-Chairs: Yoonseok Lee (University of Florida), Soonwon Choi (Massachusetts Institute of Technology)
Technical Group A-2	**Chemistry (CHM)**	Chair: Jiwoong Park (University of Chicago), Co-chairs: Dong Hee Son (Texas A&M University), Hoi Sung Chung (National Institutes of Health)
Technical Group A-3	**Math/Applied Math/Statistics (MAS)**	Chair: Young-Ju Lee (Texas State University), Co-Chairs: Seungil Kim (Kyung Hee University), Jangwoon Lee (University of Mary Washington)
Technical Group B-1	**Medical and Pharmaceutical Science (MPS)**	Chair: Tae-Hyung Kim (University of New Mexico) Co-Chairs: Jiyoung Lee (George Washington University), Hun-Goo Lee (Massachusetts General Hospital/Harvard Medical School)
Technical Group B-2	**Food, Agriculture, Ecology and Nutrition (FAN)**	Chair:Yoo Kim (Oklahoma State University) Co- Chairs: Sungeun Cho (Auburn University), Kee Hong Kim (Purdue University)
Technical Group B-3 / C-1	**Biological and Biomedical Sciences (Biology, Molecular Biology, Cognitive Science, Botany, Zoology, Biomechanics, etc.)/Bioengineering and Biomedical Engineering (BME)**	Chair: Hyunjoon Kong (University of Illinois at Urbana-Champaign) Co-Chairs: Deok Ho Kim (Johns Hopkins University), Young Bin Choy (Seoul National University)
Technical Group C-2	**Chemical, Textile, Energy, and Nuclear Engineering (CHE)**	Chair: Hyun-Tae Hwang (University of Kentucky) Co-Chair: Jaewon Lee (University of Missouri)
Technical Group C-3	**Mechanical, Aerospace and Naval Engineering (MAN)**	Chair: Eon Soo Lee (New Jersey Institute of Technology) Co-Chairs: Martin Byung-Guk Jun (Purdue University), W. Jong Yoon (University of Washington, Bothell)
Technical Group C-4	**Materials Science and Engineering, Nanotechnology (MSE)**	Chair: Jiyoung Kim (University of Texas at Dallas) Co-Chairs: Chang-Yong Nam (Brookhaven National Laboratory), Jang-Sik Lee (POSTECH)
Technical Group C-5	**Civil and Environmental Engineering, Architecture (CEA)**	Chair: Youngguk Seo (Kennesaw State University) Co-Chair: Jung Heum Yeon (Texas State University)
Technical Group C-6	**Electrical and Computer Engineering (ECE)**	Chairs: Jin W Choi (Michigan Technological University) Co-Chairs: Wookyung Sun (Seoul National University), Jeongwon Park (University of Nevada at Reno), Jungkwun Kim (University of North Texas)
Technical Group C-7	**Computer and Information Sciences (CIT)**	Chair: Ohbong J. Kwon (New York City College of Technology) Co-Chairs: Hoyoung Hwang (Hansung University), Donghoon Kim (Arkansas State University)
Technical Group C-8	**Industrial, Manufacturing, and Systems Engineering, Management Sciences, Operations Research (IMS)**	Chair: Jeong Hoon Choi (Youngstown State University) Co-Chairs: Tai-Woo Chang (Kyonggi University), Hyesung Park (Georgia Gwinnett College)
Technical Group D-1	**Social Sciences (Anthropology, Economics, Political Science, Sociology, Public Policy, etc.), Psychology, Digital Arts, STEM Education, and Other Sciences (SSP)**	Chair: Jongpil Cheon (Texas Tech University) Co-Chairs: Nicholas D. Hartlep (Berea College), Kyungbin Kwon (Indiana University – Bloomington), Gilbert Park (Ball state University)

Innovation and Entrepreneurship Symposium (IES) Group

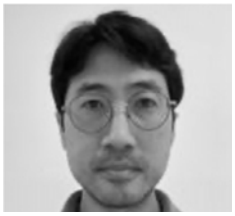
Chair: IL Minn (Johns Hopkins University)

FIRE (Fostering Innovation in Rising Experts) Symposium

Chair: TJ (Tae Joong) Park (MIT)

Physics (PHY)
Technical Group A-1

Chair



Harold D. Kim

Georgia Institute of Technology

Co-chairs

Chueng Ji

North Carolina State University

Soonwon Choi

Massachusetts Institute of Technology

1. Symposium Description

Quantum science is rapidly gaining popularity in physics as well as among the general public. To address the rising interest in the subject, the UKC 2023 Physics Symposium featured special focus sessions on the topics of quantum mechanics, its foundations, and the latest developments in the experimental and theoretical study of quantum systems. It consisted of three sessions with a total of 16 presentations, two of which were invited talks and fourteen of which were contributed. All presenters attended the conference in person and showed active engagement. The symposium was a great success, providing a lively forum for participants to exchange knowledge and establish new connections for future collaborations.

2. Sessions (Schedule and Description)

Aug 3 _ Thursday _ 4:00 – 6:00pm

PHY Session I: Quantum Mechanics and Beyond

Chair: Harold Kim (Georgia Tech), Soonwon Choi (MIT)

Time	Title and Speaker
4:00	**Spin Correlations and Bell's Inequality** // Chueng Ji (North Carolina State University)
4:24	**From Quantum Physics to Quantum Computing** // Alexander Kemper (North Carolina State University)
4:48	**DAMSA: A Novel Experiment Concept to Probe Dark Sector Particles** // Wooyoung Jang (University of Texas at Arlington)
5:12	**Investigation of Self-Assembled Water Chains in Biomolecular Interactions** // Byung Kim (Boise State University)

Aug 4 _ Friday _ 4:00 – 6:00pm

PHY Session II: Quantum Materials

Chair: Chueng Ji (North Carolina State University), Harold Kim (Georgia Tech)

Time	Title and Speaker
4:00	**Manipulation of Quantum Materials** // Na Hyun Jo (University of Michigan)
4:24	**Tunneling Andreev Reflection: Direct Access to the Superconductivity in the Atomic Resolution** // Wonhee Ko (University of Tennessee, Knoxville)
4:48	**Quantum Geometry for the Optical Properties of Crystals** Invited // Junyeong Ahn (Harvard University)
5:12	**Quantum Phases and Transitions under Decoherence: Many Body Physics of Information** // Jong Yeon Lee (Kavli Institute of Theoretical Physics)
5:36	**Toolbox for Analog Quantum Simulations** // Soonwon Choi (MIT)

PHY Poster Session

Chair: Harold Kim (Georgia Tech), Chueng Ji (North Carolina State University), Soonwon Choi (MIT)

PHY P1	**Launching Multiple Modes in Hyperbolic vdW Heterostructures** // Byung-Il Noh (Auburn University)

3. Session Recep

Prof. Harold Kim chaired the first session, "*Quantum Mechanics and Beyond*," which covered a wide range of research topics including quantum entanglement (Chueng Ji, NC State), variational quantum eigensolver (Lex Kemper, NC State), a novel experiment to investigate dark matter (Wooyoung Jang, UT Arlington), and the study of the microstructure of water (Byung Kim, Boise State). Prof. Chueng Ji chaired the second session, "*Quantum Materials*," which included talks on the collective phenomena of quantum materials (Na Hyun Jo, UMich; Junyeong Ahn, Harvard; Wonhee Ko, UT Knoxville) and their application for quantum computation (Jong Yeon Lee, KITP; Soonwon Choi, MIT). Dr. Na Hyun Jo and Dr. Junyeong Ahn were invited as this year's winners of the Outstanding Young Researcher Award (OYRA) administered by the Association of Korean Physicists in America (AKPA). Prof. Soonwon Choi chaired the third session, "*Frontiers of Quantum Information Science and Technology*," which featured reports on state-of-the art theory (Isaac Kim, UC Davis; Kyungjoo Noh, AWS) and experiments (Yonuk Chong, SKKU; Junho Suh, POSTECH; Gihwan Kim, Caltech; Joonhee Choi, Stanford) in quantum information science and technology. One PhD student (Byung-Il Noh, Auburn) contributed a presentation to the poster session.

This year's participants in the UKC 2023 Physics Symposium represented a wide range of academic career stages, from graduate students and postdocs to junior and senior faculty members. Notably, one presenter was primarily affiliated with a company in the quantum industry, reflecting the close relationship between industry and academia in the field of quantum information science and technology. In addition to academic presentations and lively discussions, the symposium also included ample time for networking and discussion of hot topics such as LK-99. A large fraction of the participants were first-time attendees of UKC and were encouraged to become active members of KSEA and AKPA.

4. Group Photos

Chemistry (CHM)
Technical Group A-2

Chair

Jiwoong Park

University of Chicago

Co-chairs

Dong Hee Son

Texas A&M University

Hoi Sung Chung

National Institutes of Health

1. Symposium Description

Chemistry has been crucial to understanding material's properties on the molecular level, and its impacts have been broadened to various applications of energy, new materials, biology, healthcare, and engineering. Thus, interdisciplinary research is becoming increasingly critical in addressing complex problems. This year's Chemistry Technical Group will organize symposia focused on the following research areas: (1) design and characterization of new materials and energy, and (2) molecular approaches for biology and healthcare. Leading researchers working at the forefront of these topics will be invited to discuss the structures and functions of molecular systems and noble experimental, theoretical, and computational techniques. Researchers, postdocs, and students working in academia, industry, and government laboratories are strongly encouraged to participate in scientific discussions and network building.

2. Sessions (Schedule and Description)

Aug 3 _ Thursday _ 4:00 – 6:00pm

CHM Session I: Chemical Approaches for Biomedicine

Chair: Hoi Sung Chung (NIH), Dong Hee Son (Texas A&M University)

Time	Title and Speaker
4:00	**Towards Single Virus Genomics** Invited // Hee-Sun Han (University of Illinois, Urbana-Champagne)
4:20	**Nanotechnology Approaches for Real-time Neurotransmitter Detection in Stem Cell-Derived Neural Interfaces** Invited // Kibum Lee (Rutgers, The State University of New Jersey)
4:40	**Precision tumor cell death through targeting cancer-specific InDel mutations with CRISPR-Cas9** Invited // Taejoon Kwon (Ulsan National Institute of Science and Technology)
5:00	**Structure and mechanisms of DNA damage recognition and initiation in Nucleotide Excision Repair** Invited // Jung-Hyun Min (Baylor University)
5:20	**Transcription-Induced Active Forces Suppress Chromatin Motion by Inducing a Transient Disorder-To-Order Transition** Invited // Sucheol Shin (University of Texas at Austin)
5:40	**Single-molecule characterization of the early phase of amyloid-beta aggregation** Invited // Hoi Sung Chung (NIH)

Aug 4 _ Friday _ 4:00 – 6:00pm

CHM Session II: Chemical Approached for Designed Materials

Chair: Jiwoong Park (U. Chicago), Young Jong Lee (NIST)

Time	Title and Speaker
4:00	**Silver Chalcogenide Infrared Colloidal Quantum Dots** Invited // Kwang Seob Jeong (Korea University)
4:20	**Nature-inspired synthetic polymers for customized biomedical applications** Invited // Soon Mi Lim (Texas A&M University)

4:40	**Photoemission of Upconverted Hot electrons from Doped Quantum Dots Effect of Charge and Ligand** Invited // Dong Hee Son (Texas A&M University)
4:55	**Infrared Sees Proteins in Water, Sensitively** Invited // Young Jong Lee (NIST)
5:10	**Introduction advanced environmental risk assessment for pesticide residues in environmental and AISS** // Hyosub Lee (Residual Agrochemical Assessment Division)
5:25	**New 2D with atomically thin crystals** Invited // Jiwoong Park (University of Chicago)
5:40	**Short oral presentations (each 7 min)** • **Vapor-Phase Anisotropic Polymer Particle Synthesis through Condensed Droplet Polymerization** // Kwang-Won Park (Cornell University) • **Iron-Gold Contacts: An Effective Linker for Ferrocene-Based Single-Molecule Electronics** // Woojung Lee (Columbia University) • **Generalized understanding of double layer for concentrated aqueous electrolytes and ionic liquids** // Suehyun Park (Georgia Institute of Technology)

Aug 4 _ Friday _ 6:00 – 9:00pm
CHM Poster Session
Chair: Jiwoong Park (U. Chicago), Dong Hee Son (Texas A&M University), Hoi Sung Chung (NIH)

Time	Title and Speaker
CHM P1	**Vapor-Phase Anisotropic Polymer Particle Synthesis through Condensed Droplet Polymerization** // Kwang-Won Park (Cornell University)
CHM P2	**Iron-Gold Contacts: An Effective Linker for Ferrocene-Based Single-Molecule Electronics** // Woojung Lee (Columbia University)
CHM P3	**Generalized understanding of double layer for concentrated aqueous electrolytes and ionic liquids** // Suehyun Park (Georgia Institute of Technology)

3. Session Recep

The UKC 2023 Chemistry (CHM) Symposium has been held in person comprising two sessions with total 15 presentations, among which 11 were invited talks and 4 contributed. The participants reflected a nice balance of university professors (8), research scientists at government laboratories (3), and graduate and postdoctoral researchers (4). Three participants also presented posters after the day 2 session. The two sessions held over two days provided valuable opportunities to share research results pursued by Korean chemists at different career stages and to build mentor-mentee relationships that could benefit junior researchers for many years to come. Overall, the symposium was a great success.
The two sessions each focused on (1) chemical approaches for biomedicine (day 1) and (2) chemical approaches for designed materials (day 2). The highlights from the oral sessions included discussion of many exciting and cutting edge results, such as: the development of single genome diagnosis platform (Prof. Hee-Sun Han, UIUC), CRISPR based cancer detection and precision cell death (Prof. TaeJoon Kwon, UNIST), single molecule study of amyloid-beta aggregation (Dr. Hoi Sung Chung, NIH), realtime ultrasensitive FTIR imaging microscopy (Dr. Young Jong Lee, NIST), and development of national scale pesticide detection and monitoring network (Dr. Hyosub Lee, Korea Agricultural Technology Promotion Agency). The novelty, quality, and breadth of the topics covered in this symposium was impressive.
There were two networking dinners hosted by the leadership team in downtown Dallas (day 1) and at the symposium hotel (day 2). This provided valuable opportunities for exchanging informal discussion on wide-ranging topics of chemistry research and career development. It is particularly notable that graduate and postdoctoral researchers were able to directly interact with researchers at more advanced stages. For example, Dr. Sucheol Shin, currently applying for a faculty position in the US, found the advice from faculty members at various US universities extremely valuable. Pre-tenure faculty members were also able to learn about the inner workings of the department leadership and how to be more effective in building a successful academic network and career.

Another exciting outcome is the initiation of a strong connection between the UKC chemistry leadership and the Korean Chemical Society (KCS). A leadership member of KCS, Prof. Kwang Seob Chung of Korea University was the lead speaker of the day 2 symposium, and we had a planning meeting for strengthening the connection between KCS and UKC chemistry group in the future. One concrete proposal is to invite Korean academics who are visiting various US institutions for a sabbatical year with the help of the existing KCS network. This will be discussed during the first executive KCS session that will be held in the fall.

The chemistry symposium is rapidly gaining a momentum and we look forward to a even more vibrant session next year. This is exciting given where we were two years ago, when there was no chemistry symposium at UKC.

4. Group Photo

Mathematics, Applied Math and Statistics (MAS)
Technical Group A-3

Chair

Young- Ju Lee
Texas State University

Co-chairs

Seungil Kim
Kyung Hee University

Jangwoon Lee

University of Mary Washington

1. Symposium Description

The MAS (mathematics, applied math, and statistics) symposium invites enthusiastic researchers, scientists, and engineers to discuss the latest scientific and technical approaches. The symposium covers various aspects of all areas in mathematics, applied math and statistics including, but not limited to, classical theories in mathematics and statistics and practical applications inspired by real-world situations. The UKC 2023 MAS provides an opportunity for scientists and engineers to share their experiences and ideas on how different challenges we face can be turned into opportunities.

2. Sessions (Schedule and Description)

Aug 3 _ Thursday _ 4:00 – 6:00pm

MAS Session I: Mathematical Theory and its Applications I
Chair: Seungil Kim (Kyunghee University)

Time	Title and Speaker
4:00	**GMsHDG method for nonlinear porous media** Invited // Minam Moon (Korea Military Academy)
4:20	**An efficient K-way constrained normalized cut and its connection to algebraic multigrid method** // Youngju Lee (Texas State University)
4:40	**The moduli space of holomorphic chains of rank one over a compact Riemann surface** // JingHyung To (Indiana University at Bloomington)
5:00	**Inference about differences in predictive skill between infectious disease forecasting models** // Dongah Kim (University of Massachusetts at Amherst)
5:20	**The effect of NK cells on oncolytic virotherapy** // Dongwook Kim (Texas A&M University at Kingsville)
5:40	**Exploring dynamics of HIV infections: an analysis of the Susceptible-Infected-Virus model in deterministic and stochastic forms** // Jangwoon Lee (University of Mary Washington)

Aug 4 _ Friday _ 4:00 – 6:00pm

MAS Session II: Mathematical Theory and its Applications II
Chair: Youngju Lee (Texas State University), Jangwoon Lee (University of Mary Washington)

Time	Title and Speaker
4:00	**Rigidity of steady solutions to the Navier-Stokes equations in high dimensions** Invited // Jeaheang Bang (University of Texas at San Antonio)
4:20	**Photoacoustic tomography with direction dependent data** // Sunghwan Moon (Kyungpook National University)
4:40	**Reconstruction of the shape and boundary condition in inverse scattering for an obstacle with partial generalized impedance boundary** // Heejin Lee (Purdue University)
5:00	**Recent development of Bayesian joint modeling for medical sciences** // Seongho Song (University of Cincinnati)
5:20	**Bayesian clustering factor models** // Hwasoo Shin (Virginia Tech)
5:40	**Optimal rational approximation for the fractional diffusion problem** // Seungil Kim (Kyunghee University)

3. Session Recep

The UKC 2023 Mathematics, Applied Mathematics, Statistics (MAS) Symposium has been held comprising two sessions with total 10 presentations, among which 2 were invited talks and 8 contributed. The initial proposal had two more speakers intending to deliver their presentations but they were not able to do it due to some circumstances. The positions of the speakers participating the symposium were various from phd student (1) and postdoc researchers (3) to tenure-track/tenured faculties (6).

The symposium was mainly focused on various topics of pure mathematics, applied mathematics, and statistics. While there was one talk of pure mathematics, which is classified as algebraic geometry, many different topics on applied mathematics were presented such as the regularity on the Navier-Stokes equations, inverse problem with partial impedance boundary conditions, GMsHDG method for porous media, an efficient image segmentation method, optimal rational approximation method for fractional diffusion problems, and dynamics of SIV models in deterministic and stochastic forms. In addition, the contribution of the talks on diverse topics of the Bayesian method was an essential component of the success of the symposium. Those were an analysis about difference in predictive skill between infectious disease forecasting models, an analysis on Bayesian clustering factor models, and recent development of Bayesian joint modeling for medical sciences.

In this year the MAS symposium was successfully completed with the hope that there would be more flourishing collaborations and networks among researchers in US and Korea. From the initial efforts of the participants to enlarge the networks it would be believed that the MAS symposium could gather more researchers from US and Korea in the next year's event in San Francisco.

4. Group Photo

Medical Science, Pharmaceutical Science, Veterinary Medicine, Physical Education (MPS) Technical Group B-1

Chair

Tae-Hyung Kim

University of New Mexico

Co-chairs

Jiyoung Lee

George Washington University

Hun-Goo Lee

Massachusetts General Hospital Harvard Medical School

1. Symposium Description

This year, B-1 (previously MPS) will bring together life sciences and healthcare, and academic professionals on one stage to deliberate on cross-cutting-edge science. The world is changing to have a smart decision among the increased complexities of knowledge. We will deep dive into major three therapeutic areas such as oncology, immunology (including immuno-oncology), and neurology to focus on research and development. All speakers and poster presenters are from across the U.S. and Korea that can share their innovative research and solutions to each therapeutic issue.

2. Sessions (Schedule and Description)

Aug 3 _ Thursday _ 4:00 – 6:00pm

MPS Session I: Cancer and Metabolism
Chair: Jiyoung Lee (George Washington University)

Time	Title and Speaker
4:00	**Herbal Extracts from Lycii Radicis Cortex and Achyranthes Japonica Prevent Multiple Myeloma Progression** // Donghoon Yoon (University of Arkansas for Medical Sciences)
4:25	**High extracellular glucose promotes cell motility by modulating cell deformability and contractility via cAMP-RhoA-ROCK axis in human breast cancer cellsa** // Tae-Hyung Kim (University of New Mexico)
4:50	**Dysregulated 24-dehydrocholesterol reductase (DHCR24) in Head and Neck Squamous Cell Carcinoma** // Jiyoung Lee (George Washington University)
5:15	**Metabolic Vulnerabilities of Squamous Cell Carcinomas** Invited // Jungwhan Kim (University of Oklahoma Health Science Center)
5:45	**Poster Presentation Flash Talks (3 min each)** • **Expression and Characterization of MYO7A Isoforms Localized to the Stereocilia Upper Tip-link Density** // Jinho Park (University of Florida) • **Slow Myosin Binding Protein-C and Congenital Muscle Disease** // Taejeong Song (University of Cincinnati Medical School)

Aug 4 _ Friday _ 4:00 – 6:00pm

MPS Session II: Neurobiology, Immunology, and Beyond
Chair: Hungoo Lee (MGH/Harvard)

Time	Title and Speaker
4:00	**Poster Presentation Flash Talks (3 min each)** • **Augmented Reality Glasses for Enhancing Coaching Abilities of Exercise Instructors** // Jeeyoung Hong (Kongju National University) • **Associations between Binge Eating Severity and Factors from Social Comparison among Korean American women** // Bo Ra Kim (University of Texas at Austin) • **Sigma Anti-Bonding Calcium Carbonate (SAC) cream enhances the wound-healing process in C57/BL6 mouse** // Yeonju Kang (University of Arkansas) • **Sigma Anti-Bonding Calcium Carbonate (SAC) and Biofilm Promote Wound Healing in B6.Cg-Lepob/J (ob/ob) Mouse** // Hyejeong Jeong (University of Arkansas)
4:30	**Sex difference in the profile of extracellular bioactive lipids of conjunctival epithelial cells during allergic inflammation** // Changrim Lee (Harvard Medical School)
5:00	**Modulating the Host's Immune Response for Preventing Peri-implantitis in Mice** // Yejin Ki (University of Pittsburgh School of Dental Medicine)

5:30	**Ets-1 as a Negative Regulator of Peripherally Induced Regulatory T Cells and its implications in autoimmune diseases** // Choong-Gu Lee (Korea Institute of Science and Technology (KIST)
6:00	**Removing the root cause of Fragile X syndrome by Inducing the contraction of CGG repeats and FMR1 restoration** // Hungoo Lee (MGH/Harvard)

Aug 4 _ Friday _ 6:00 – 9:00pm

MPS Poster Session

Chair: Tae-Hyung Kim (University of New Mexico)

Time	Title and Speaker
MPS P1	**Augmented Reality Glasses for Enhancing Coaching Abilities of Exercise Instructors** // Jeeyoung Hong (Kongju National University)
MPS P2	**Associations between Binge Eating Severity and Factors from Social Comparison among Korean American women** // Bo Ra Kim (The University of Texas at Austin School of Nursing)
MPS P3	**Slow Myosin Binding Protein-C and Congenital Muscle Disease** // Taejeong Song (University of Cincinnati Medical School)
MPS P4	**Expression and Characterization of MYO7A Isoforms Localized to the Stereocilia Upper Tip-link Density** // Jinho Park (University of Florida)
MPS P5	**Sex Differences in Amino Acid Kinetics in Older Adults with Chronic Morbidities** // Chloe Kang (Texas A&M University Center for Translational Research in Aging & Longevity)
MPS P6	**Sigma Anti-Bonding Calcium Carbonate (SAC) cream enhances the wound-healing process in C57/BL6 mouse** // Yeonju Kang (University of Arkansas for Medical Sciences)
MPS P7	**Sigma Anti-Bonding Calcium Carbonate (SAC) and Biofilm Promote Wound Healing in B6.Cg-Lepob/J (ob/ob) Mouse** // Hyejeong Jeong (University of Arkansas for Medical Sciences)
MPS P8	**Multiple Sclerosis Research Across the African Continent: A Systematic Review** // Soonmyung Hwang (Icahn School of Medicine at Mount Sinai)

Aug 5 _ Saturday _ 8:00 – 10:00am

MPS Session III: Public Health and Technology

Chair: Soojin Yoo (University of Texas Rio Grande Valley), Co-Chair: Jiyoung Lee (George Washington University)

Time	Title and Speaker
8:00	**Multi-Omics Profiling for Evaluating Carcinogenic Exposure and Health Effects in Firefighters during Emergency Fires** Invited // Jooyeon Hwang (University of Texas Health Sciences Center at Houston)
8:25	**Bridging the Gap: A Community Approach to Addressing Health Disparities in North Nashville through Food Access Community Mapping** // Wansoo Im (Meharry Medical College)
8:50	**Differential Moderating Roles of the Salience Network and Central Executive Network in Internalizing Psychopathology and Fluctuating Negative Affect** // Ha Jeong Park (Texas A&M University Department of Psychological and Brain Sciences)
9:15	**Clinical and Environmental Effects of Healthy Home Interventions** // Insung Kang (Illinois Institute of Technology)
9:40	**Mutations in the UBIAD1 gene, the vitamin K2 synthesizing enzyme, cause Schnyder Corneal Dystrophy (SCD) by inhibiting ER-associated degradation of HMG CoA reductase** // Dong-Jae Jun (UT Southwestern Medical Center)

3. Session Recep

(1) MPS Session I: Cancer and Metabolism

B-1 symposium session for metabolism in health and diseases was held on the August 3rd (Thursday) from 4 to 6 pm at Dallas conference room. This session comprised of 4 seminars by speakers and 2 flash talks by poster presenters. Main research topics discussed in this session include metabolism and diseases based on the speaker's most recent research findings. The session starts with Dr. Donghoon Yoon at the University of Arkansas for Medical Sciences for therapeutic effects of herbal extracts on immune cells including osteoblast cells in diseases such as multiple myeloma that suggest a responsible factor for bone formation and further identified unique changes in the gut microbiome and short-chain fatty acids in animals. Next, Dr. Tae-Hyung Kim at the University of New Mexico Health Sciences center presented novel findings of mechanotype and behaviors depending on nutrient availability for motility of tumor cells using novel high-throughput mechanotyping assays. This novel finding suggests potential therapeutic targets to manage breast cancer metastasis for patients. The third speaker Dr. Jiyoung Lee at The George Washington University and GW Cancer Center presented research progress of cholesterol metabolism in head and neck cancer focused on dehydrocholesterol-24 and its therapeutic potential as a novel biomarker for patients with head and neck cancer. The invited speaker. Dr. Jungwhan Kim at the University of Oklahoma Health Science Center, gave a talk of metabolic vulnerability for squamous cancer cells that elevated glucose metabolism through glucose transport gene amplification, thus targeting glucose transporter is effective to generate cancer lethality. Moreover, this session provided an opportunity for previews of poster presentation through a flash talk to the audiences for mechanistic insights for muscle contractility by Dr. Taejeong Song, University of Cincinnati, and biophysical structural studies of Myo7A for deafness by Dr. Jinho Park, University of Florida. Each seminar was followed by a Q&A session for further discussion, sharing ideas and future collaboration.

(2) MPS Session II: Neurobiology, Immunology, and Beyond

In session 2, we had four speakers who presented their recent works on diverse biomedical fields. Dr. Chargrim Lee (Harvard Medical School) presented the role of bioactive lipid mediators, especially specialized pro-resolving mediators (SPMs) and proinflammatory mediators (PIMs), in the cellular response of CGCs during histamine- mediated allergic inflammation in eyes. The conjunctival goblet cells (CGCs) that secrete mucins to wet and protect the ocular surface over-secrete mucins in response to histamine stimulation, which causes ocular surface instability and visual disturbance. The success of this study will provide new insights into the bioactive lipid-mediated ocular surface protective mechanism generated by the conjunctiva and the basis for a tailored sex-dependent, lipid- based therapeutic approach in the management of vision-debilitating ocular surface diseases. Ph.D. candidate Yejin Ki (University of Pittsburgh School of Dental Medicine) presented preventive methodologies for peri-implantitis. Peri-implantitis is an inflammatory disease of the soft tissue and bone around dental implants, which is mediated by the host's immune response. She proposed to develop a novel therapeutic method to prevent peri-implantitis by modulating the host's immune response. Her goal was to test the feasibility of local delivery of CCL2-releasing microparticles (CCL2 MPs) as a preventive therapy for bone loss in peri-implantitis. Her Micro-CT analysis showed that there was a statistically significant reduction of bone loss around implants treated with CCL2 MPs compared to diseased and blank MPs treated implants, demonstrating the feasibility of CCL2 local delivery as a preventive therapy in peri-implantitis. Dr. Choong-Gu Lee (Korea Institute of Science and Technology) presented E26 transformation-specific-1 (Ets-1) mediated regulation on regulatory T cells. Transcription factor Ets-1 controls a wide variety of cellular processes and plays an important role in autoimmune diseases including development, proliferation, and survival of T cells. Regulatory T cells (Treg cells) constitute a population of CD4+ T cells that limits immune responses. Transcription factor Foxp3 plays key roles in determining the development and function of Treg cells. Though Ets1-/- mice developed T cell-mediated splenomegaly and lupus-like autoimmune phenotype, the mice showed no severe autoimmune disease symptoms in steady state in the aged mice. His team found considerable amount of CD4+ Foxp3+ T cells in the peripheral lymphoid tissues of Ets1-/- mice. Interestingly, most of them were CD25-Nrp1-, suggesting the possibility of peripherally induced Foxp3+ T cells. These Foxp3+ T cells express reduced levels of Treg phenotypic markers such as ICOS, GITR and CTLA4 and exhibit naïve-like T cell phenotypes (CD44lo CD62L+), suggesting they are in the transition of becoming pTregs from naïve T cells. In addition, naïve T cells from Ets1-/- mice were more prone to become induced Treg cells in vitro and in vivo. His team have also confirmed the negative role of Ets1 in Foxp3 regulation through the ETS domain (known for DNA binding). In summary, his data suggests that Ets-1 may repress Foxp3 expression in naïve CD4+ T cell , thereby acting as an important negative regulator of peripherally induced regulatory T cells. Dr. Hungoo Lee (MGH/Harvard) described potential methods for correcting the genetic cause of Fragile X syndrome (FXS), one of the most common monogenic causes of autism spectrum disorders (ASD), without introducing gene-

editing nucleases in cellular models. In FXS patients, very long expansion of CGG trinucleotide repeats (>200 times) at the 5' UTR of the FMR1 gene causes epigenetic silencing of FMR1, a crucial gene for brain development. By investigating conditions favorable to FMR1 reactivation, he has found that certain sets of small molecules (so-called 5i) can strongly reactivate FMR1 mRNA and its protein FMRP expression in human embryonic stem (ES) and induced pluripotent stem (iPS) with FXS full mutation. Surprisingly, it also entails the shortening of the long CGG repeats. He traced the mechanism to a site-specific R-loop — a 3-stranded RNA-DNA structure — that is both necessary and sufficient for repeat contraction. Collectively, his data implicate a positive feedback loop of DNA demethylation, de novo transcription, R-loop formation, and DNA repair in CGG contraction and FMR1 reactivation. The TG B1 MPS symposium also provided an opportunity to poster presenters to briefly introduce their poster at the Poster FlashTalk session.

(3) MPS Session III: Public Health and Technology

On the last day of the UKC, the B1 (MPS) technical group chaired by Soojin Yoo (Session chair) and Jiyoung Lee (Session Co-Chair) provided a session early in the morning on Saturday. Broadly, the topics of the five talks were focused on clinical translational research relevant to patient care, following the theme of Session III: Public Health and Technology. The scope and level of research were very diverse, ranging from firefighters' health, community food access mapping, psychological and brain sciences, and creating a healthy home environment, all the way to genetics. The first speaker, Dr. Jooyeon Hwang, began the talk by discussing Multi-Omics Profiling for Evaluating Carcinogenic Exposure and Health Effects in firefighters during Emergency Fires. The real-world implications were particularly interesting to the audience. As a first-year KSEA member and an invited speaker, Dr. Hwang delivered an impressive presentation. The second speaker, Dr. Wansoo Im, then discussed the technical challenges in bridging the gap: A Community Approach to Addressing Health Disparities in North Nashville through Food Access Community Mapping. The third speaker was Ms. Ha Jeong Park, a doctoral student from Texas A&M University's Department of Psychological and Brain Sciences, who talked about the Differential Moderating Roles of the Salience Network and Central Executive Network in internalizing Psychopathology and Fluctuating Negative Affect. The fourth speaker, Mr. Insung Kang, a doctoral student from the Illinois Institute of Technology, presented on the Clinical and Environmental Effects of Healthy Home Interventions. Finally, the fifth and last speaker, Dr. Dong-Jae Jun from the University of Texas Southwestern Medical Center, discussed Mutations in the UBIAD1 gene, which is the vitamin K2 synthesizing enzyme, causing Schnyder Corneal Dystrophy by inhibiting ER-associated degradation of HMG CoA reductase. Despite this session being scheduled for the early morning from 8 am to 10 am on Saturday, the last day of UKC, many attendees came to witness the various and diverse topics, leading to numerous discussions. The B1 group made successful efforts to find speakers with diverse backgrounds, including students and experts in various fields, resulting in a well-rounded session.

4. Group Photos

Group photo 1: After session I

Group photo 2: After session II

Group photo 3: After session III

Agriculture, Ecology, Food, Nutrition (FAN)
Technical Group B-2

Chair

Yoo Kim

Oklahoma State University

Co-chairs

Sungeun Cho

Auburn University

Kee Hong Kim

Purdue University

1. Symposium Description

Agriculture, Ecology, Food, and Nutrition Symposium will provide professional opportunities for leading and rising scientists and engineers to learn latest scientific, technical advances in various fields of agriculture, ecology, food and nutrition in US and Korea. The symposium covers all areas related to the UKC 2023's topic, '*Discovery, Innovation and dissemination for transformative impact*'. Areas include: 1. Agricultures including agronomy, entomology, crop, soil science, & environmental science, horticulture, plant science, plant pathology, animal sciences, agricultural biotechnology & engineering, agricultural economics & agribusiness, and other agricultural areas; 2. Ecology including physiological ecology & behavioral ecology, population ecology, community ecology, ecosystem, landscape, human ecology, and other ecological areas; 3. Food science including functional food, food processing, food quality, safety and regulation, food nanotechnology, food microbiology, food chemistry, food engineering, sensory science, and other emerging food technologies; and 4. Nutrition including dietetics, nutrient metabolism and physiology, precision nutrition, nutritional management in human diseases including obesity, diabetes, cancer, and stroke, muscle and protein metabolism, gene and diet interactions, international nutrition, nutrition and intestinal microbiome.

2. Sessions (Schedule and Description)

Aug 3 _ Thursday _ 4:00 – 6:00pm

FAN Session I: Food Science and Technology

Chair: Sungeun Cho (Auburn University), Yoo Kim (Oklahoma State University)

Time	Title and Speaker
4:00	**Metabolomics in food and agricultural science** Invited // Joonhyuk Suh (University of Georgia)
4:20	**New antioxidants for frying oil developed in NCAUR, ARS, USDA** // Hong-sik Hwang (USDA, ARS, NCAUR)
4:40	**R&D Direction for Plant-based Meat and Cultivated Meat: Critical Variables for Consumer's Sensory Acceptance** // Jung Han (Eat Just)
5:00	**Comparative Study of the Susceptibility to Blue Light Inactivation of Foodborne Pathogens and Spoilage Bacteria** // Minji Hur (University of Georgia)
5:20	**Pathway-based metabolomics reveals the biosynthesis of key flavor compounds in apple** // Min Jeong Kang (University of Georgia)
5:40	**Influence of stunning methods on sensory characteristics of chicken breast meat using electronic senses** // Sungeun Cho (Auburn University)

Aug 4 _ Friday _ 4:00 – 6:00pm

FAN Session II: Nutrigenomics

Chair: Kee Hong Kim (Purdue University), Yoo Kim (Oklahoma State University)

Time	Title and Speaker
4:00	**Advancing Sustainable Food Production Through Synthetic Biology** // Eun Joong Oh (Purdue University)
4:30	**Dietary Curcumin Attenuates Hepatic Cellular Senescence by Suppressing MAPK/NF-κB Signaling Pathway in Aged Mice** // Da-Yeon Lee (Oklahoma State University)

4:50	**Systems Genetic Analysis of Atherosclerosis and Gut Microbiota in a Diet-induced Hyperlipidemic Diversity Outbred F1 Mouse Population** // Myungsuk Kim (Korea Institute of Science and Technology)
5:15	**New insights into the role of piceatannol in cancer-associated cachexia** // Kee-Hong Kim (Purdue University)
5:40	**Protective Effects of Dietary Curcumin on Type 3 Diabetes** // Yoo Kim (Oklahoma State University)

Aug 4 _ Friday _ 6:00 – 9:00pm

FAN Poster Session

Chair: Keehong Kim (Purdue University), Yoo Kim (Oklahoma State University)

Time	Title and Speaker
FAN P1	**Development of a method for risk assessment of organic pollutant exposure using monitoring data in the agricultural sector** // Sangik Suh (Geongsang National University)
FAN P2	**Autonomous Stand Counting in Field Pea using Aerial Imagery** // Jeong-Hwa Kim (North Dakota State University)
FAN P3	**Effects of Berry Volatile Extracts on LPS-induced Intestinal Inflammaation in a Caco-2/ RAW264.7 Co-culture Model** // Sun-Ok Lee (University of Arkansas)
FAN P4	**System Dynamics Model for Autonomous and Controlled Environment Potato Production System** // Jae Hyeon Ryu (University of Idaho)

3. Session Recep

All 6 speakers and 5 speakers were presented during Sessions I and II on time. Each paper author presented four posters. The focus of the FAN TGS centered mainly on two topics: 1) Food Science and Technology and 2) Nutrigenomics. The initial session, Food Science and Technology, delved into several cutting-edge techniques. One example is metabolomics, a newly emerging toolbox in omics science that involves analyzing small molecules in biological systems to comprehensively understand organisms' biochemical mechanisms at the chemical level. Additionally, novel antioxidants aimed at preventing the oxidation of edible oils were discussed, along with the sensory science aspect of replicating the sensory qualities of animal-based meats. Overcoming the persistent barrier of taste for trial and repeated purchase was also highlighted.

The subsequent session, Nutrigenomics, encompassed the roles of functional foods, including food bioactive compounds, in the prevention of chronic diseases such as obesity, diabetes, cardiovascular diseases, cancer, and aging-associated neurodegenerative diseases. As an illustration, the potent anti-aging mechanism of dietary curcumin against hepatic cellular senescence was explored. Moreover, the interaction between gut microbiota and a specific cardiovascular disease, atherosclerosis, was examined, along with the role of piceatannol in cancer-associated cachexia—a progressive metabolic disorder linked to the wasting of adipose tissue and skeletal muscle. The presentation also delved into the impact of the natural turmeric food bioactive compound on type 3 diabetes, an alternate term for Alzheimer's disease.

Biological and Biomedical Sciences (Biology, Molecular Biology, Cognitive Science, Botany, Zoology, Biomechanics, etc.) / Bioengineering and Biomedical Engineering (BME) Technical Group B-3 / C-1

Chair

Hyunjoon Kong

University of Illinois at Urbana-Champaign

Co-chairs

Deok Ho Kim

Johns Hopkins University

Young Bin Choy

Seoul National University

1. Symposium Description

As in any other major industry, problem solving in modern medicine increasingly requires a true convergence of many scientific and engineering fields. While some of the last frontiers of biomedicine, such as neuroscience and regenerative medicine, critically demands new ideas and tools from other disciplines, paradigm-shifting technological innovations in information science, nanotechnology, and robotics could open new opportunities in healthcare. At the same time, a new generation of engineers, "fluent" in many different languages of science, are creating entirely new fields to view the old questions with a fresh look. In the BME symposium, we strive to provide a stimulating forum for all researchers willing to go beyond the "comfort zone" to explore new opportunities in biomedical engineering.

2. Sessions (Schedule and Description)

Aug 3 _ Thursday _ 4:00 – 6:00pm

BME Session I: AI & Big Data Applications in Biomedicine

Chair: YoungBin Choy (Seoul National University), Co-Chair: Juhun Lee (University of Pittsburgh)

Time	Title and Speaker
4:00	**Progress and Trends in Artificial Intelligence for Colonoscopy** Invited // Dongheon Lee (Chungnam National University)
4:17	**Multimodal Interfaces for Immersive Virtual Reality** // Jinryong Kim (University of Texas at Dallas)
4:34	**Image-based Deep Survival Learning Model for Risk Stratification of Cardiovascular Disease using Retinal Fundus Image** // Jooyoung Chang (R&D, XAIMED)
4:51	**Machine Learning of Colors for mHealth Applications** // Young L. Kim (Purdue University)
5:08	**Assessing the generalization of graph neural networks** // Kijung Yoon (Hanyang University)
5:25	**Isotropic cellular resolution across centimeter field of view using subvoxel axially sweeping light sheet microscopy (SV-ASLSM)** // Juhyun lee (University of Texas at Arlington)
5:43	**Analysis of GAN Artifacts in Breast Screening Mammogram Simulation** // Juhun Lee (University of Pittsburgh)

Aug 4 _ Friday _ 4:00 – 6:00pm

BME Session II: Biomedical Devices and Materials for Biosensing, Diagnostics, and Therapeutics

Chair: Youngjae Chun (University of Pittsburgh), Co-Chair: Jaeseok Yu (DGIST)

Time	Title and Speaker
4:00	**Ultra-sensitive Silicon Photonic Opto-mechanical Ultrasound Sensor for Biomedical Photoacoustic Imaging: Proof-of-concept study** Invited // Jaeseok Yu (DGIST)
4:20	**Smart Contact Lenses for Glaucoma Care** // Chi Hwan Lee (Purdue University)
4:40	**Microbead-based Biomaterials for Cellular Immunotherapy** // Kyung-Ho Roh (University of Alabama, Huntsville)

5:00	**In vivo evaluation of fractal microelectrodes for Vagus nerve stimulation** // Hugh Lee (Purdue University)
5:20	**Advanced Cell and Gene Therapies For Effective CNS Repair Using Bionanomaterials** // Ki-Bum Lee (Rutgers University)
5:40	**Development of Novel Ultra-low Profile Coronary Stents to Treat Potential In-Stent Restenosis** // Youngjae Chun (University of Pittsburgh)

Aug 4 _ Friday _ 6:00 – 9:00pm

BME Session III: Biomedical Engineering Poster Session

Chair: Chi Hwan Lee (Purdue University), Co-Chair: Kyung Ho Roh (University of Alabama, Huntsville)

Time	Title and Speaker
BME P1	**A Homozygous IER3IP1 Mutation Causes Secretory Protein Trafficking Defects in Neural Progenitor Cells** // Lucie Yeongran Ahn (Case Western Reserve University)
BME P2	**Osteoporosis Drug Testing on Demineralized Bone Paper** // Yongkuk Park (University of Massachusetts Amherst)
BME P3	**Spatial Phenotyping of the Glioblastoma Tumor Microenvironment** // Jungmin Nam (Yale University)
BME P4	**Production of animal stealth red cells by cell surface modulation** // Hyung Kyu Kim (Kyungpook National University)
BME P5	**A Pillar and Perfusion Plate Platform for Robust Human Organoid Culture and Analysis** // Soo-Yeon Kang (University of North Texas)
BME P6	**Studying depressive disorders with a 3D neurosphere model on a micropillar chip** // NaYoung Choi (Inje University)
BME P7	**Estimation of Musculotendon Stiffness and Slack Length Using an Optimization Algorithm** // Hwan Choi (University of Central Florida)
BME P8	**Frequency Analysis on Tissue Perfusion using a Laser Speckle Contrast Imaging in vivo** // Yungjun Yoo (Optosurgical, LLC)
BME P9	**Fundamental Issues in Cognitive Workload Classification** // Junho Park (Texas A&M University)
BME P10	**Integrated Edge-AI Based Closed-loop Stimulation System for Gait Rehabilitation after Spinal Cord Injury** // Ahnsei Shon (Texas A&M University)
BME P11	**Characterization of Decellularized Plant Leaf Biomaterials for Tissue Engineering** // Chanul Kim (University of Wisconsin–Madison)
BME P12	**Development of Nanoparticle Inducing Device Through ML** // Gawon Lim (University of Illinois, Urbana-Champaign)
BME P13	**Modulating the corticospinal excitability using various non-invasive brain stimulation techniques** // Hakjoo Kim (Texas A&M University)
BME P14	**Organic Synthesis Reactions on Digital Microfluidic Device** // Hyejin Moon (University of Texas at Arlington)
BME P15	**Trans-Golgi protein TVP23B regulates host-microbe interactions via Paneth cell homeostasis and Goblet cell glycosylation** // Ran Song (University of Texas Southwestern Medical Center)
BME P16	**Effects of collagen fiber alignments in regulating osteoblasts and mineralization** // Hyejin Yoon (University of Massachusetts, Amherst)
BME P17	**Blood compatibility assessment of biomaterial surface chemistries to mitigate intrinsic coagulation pathway activation** // Kyung-Hoon Kim (University of Washington)

Time	Title and Speaker
BME P18	[SEED2023] **Ectopic high endothelial venule-targeted nanodelivery for type 1 diabetes** // Sungwook Jung (Harvard Medical School)
BME P19	[SEED2023] **A Microengineered Organoid-on-a-Chip Model of Alveolar Development in the Human Lung Sunghee** // Estelle Park (University of Pennsylvania)
BME P20	**Injectable Lignin Composites to Improve Neovascularization and Healing of Diabetic Wounds** // Jangwook P. Jung (Louisiana State University)
BME P21	**Sex difference in the profile of extracellular bioactive lipids of conjunctival epithelial cells during allergic inflammation** // Changrim Lee (Harvard Medical School)
BME P22	**Creating a Therapeutic Application Plan through Research on Rare Genetic Disorders** // Bokyeong Song (Sookmyung Women's University)
BME P23	**The Intervention of the Beta Amyloid Protein Dysfunction by Carbon Nanodots in Alzheimer's Disease** // John Bang (North Carolina Central University)
BME P24	**Particulate Matter (PM) induced Beta Amyloid (BA) Protein Aggregation** // Kevin Omar (North Carolina Central University)
BME P25	**Polystyrene Microplastics and their GI Transmembrane Passage Capacity in Zebrafish Embryos** // Majemite Iyangbe (North Carolina Central University)
BME P26	**Analysis of Clock-Controlled Genes (CCGs) in Human Intestinal Enteroids** // Suengwon Lee (University of Cincinnati)
BME P27	**Toward Hyperplexed Immunohistochemistry using Hydrogel Staining, Chiral Nanoparticles, and Nanobodies** // Kyung-Hak Choi (Noul Co., Ltd)
BME P28	**An AI-embedded and Fully Automated Device for Malaria Detection at Remote Setting** // Kyung-Hak Choi (Noul Co., Ltd.)
BME P29	**Structural and biochemical characterization of the thiolmethyltransferase 1A and 1B** // Taeyoon Jung (University of Washington)
BME P30	**Numerical and Computational Analysis of Vascular Phantom Model for Sensor Design Validation** // Youngjae Chun (University of Pittsburgh)
BME P31	**Scalable manufacturing of skin-conformal, stretchable electrodes via screen-printing** // Jong-Hoon Kim (Washington State University)
BME P32	**Multi-responsive injectable ECM-based embolic delivering therapeutic agents for treating cerebral saccular aneurysms** // Seungil Kim (University of Pittsburgh)
BME P33	**Co-transcriptional folding of nascent RNA in the presence of RNA-binding** // Sunghyun Cho (Johns Hopkins University)
BME P34	**Towards Robotic Knee Prosthesis Personalization: Impedance Control With PCA-Based Tuning Methodology** // Woolim Hong (North Carolina State University)
BME P35	**Skin-interfaced wireless device for fetal and maternal monitoring to minimize unnecessary C-section** // Hyoyoung Jeong (University of California Davis)
BME P36	**Genome-wide epigenetic editing of human microsatellite repeats using engineered zinc finger transcription factors** // Y. Esther Tak (Harvard Medical School)
BME P37	**Intelligent Upper-limb Exoskeleton using Deep Learning to predict Human Intention for Sensory-Feedback Augmentation** // Kangkyu Kwon (Georgia Institute of Technology)
BME P38	[SEED2023] **Engineered Helicase Replaces Thermocycler in DNA Amplification While Retaining Desired PCR Characteristics** // Jimin Kang (Johns Hopkins University)
BME P39	**Noninvasive estimation of intracranial pressure via diffuse correlation spectroscopy** // John Sunwoo (Massachusetts General Hospital, Harvard Medical School)

3. Session Recep

At three discipline-specific technical sessions, oral and poster presentations were delivered, mostly in person. The presence and participation of the audience have led to several intriguing and vibrant discussions on various topics. Most sessions progressed smoothly thanks to the speakers and participants.

4. Group Photo

Chemical, Textile, Energy, and Nuclear Engineering (CHE)
Technical Group C-2

Chair

Hyun-Tae Hwang

University of Kentucky

Co-chair

Jaewon Lee

University of Missouri

1. Symposium Description

This symposium provides a forum for leading experts and young researchers to present and discuss cutting-edge research advances in the broad areas of chemical engineering and related fields. Topics of interest include various aspects of such areas including (but not limited to) advanced nanomaterials/biomaterials, nanoscience/nanotechnology, and complex processes for energy, health, and environmental problems. Both experimental and computational approaches as well as synergistic methods to address grand challenges in aforementioned topics are welcome.

2. Sessions (Schedule and Description)

Aug 3 _ Thursday _ 4:00 – 6:00pm

CHE Session I: Chemical, Textile, Energy, and Nuclear Engineering
Chair: Hyun-Tae Hwang (University of Kentucky), Jaewon Lee (University of Missouri-Columbia)

Time	Title and Speaker
4:00	**Next-Generation Hybrid Models: Combining Attention Mechanisms and LSTM for Improved Predictions and Process Control in the Chemical Industry** Invited // Joseph Kwon (Texas A&M University)
4:30	**CO_2 EOR and Carbon Capture Utilization and Storage (CCUS): Field-Scale Application of Mobility-Control CO_2 Foams** // Seung Ihl Kam (Louisiana State University)
5:00	**Valorization of Nutrients in Surface Waters Through the Sustainable Biomass Production of the Attached Algae Flow-way for Biofuels** // Sungwhan Kim (Sandia National Laboratories)
5:30	**Solid-State Hydrolysis of Sodium Borohydride for Hydrogen Generation** // Hyun-Tae Hwang (University of Kentucky)

Aug 4 _ Friday _ 4:00 – 6:00pm

CHE Session II: Chemical, Textile, Energy, and Nuclear Engineering
Chair: Hyun-Tae Hwang (University of Kentucky), Jaewon Lee (University of Missouri-Columbia)

Time	Title and Speaker
4:00	**Facile Soft-lithographic Micromolding Approaches for Controlled Fabrication of Micropatterned Opal Hydrogel Materials** Invited // Hyunmin Yi (Tufts University)
4:30	**Real-time investigation of Nanoparticle Self-assembly mechanisms and its controlling factors** // Jaewon Lee (University of Missouri-Columbia)
5:00	**Disordered Cathode Materials for High-Energy Lithium-Ion Batteries** // Juhyeon Ahn (Lawrence Berkeley National Laboratory)

Aug 4 _ Friday _ 6:00 – 9:00pm

CHEPoster Session
Chair: Hyun-Tae Hwang (University of Kentucky), Jaewon Lee (University of Missouri-Columbia)

Time	Title and Speaker
CHE P1	**Spreading and wetting of transiently-crosslinked polymer spheres** // Kyujin Ko (University of Cincinnati)

3. Session Recep

The UKC 2023 Tech Group C-2 CHE (Chemical, Textile, Energy, and Nuclear Engineering) was held in person, consisting of two sessions with a total of 7 oral and 1 poster presentations, two of which were invited talks. This year, a lot of attendance was expected as both Korea and the United States lifted quarantine or travel restrictions due to COVID-19. Unfortunately, some presenters canceled and a total of 8 presenters attended. In particular, it is regrettable that there were no presenters from Korea. Nevertheless, there was a positive side to the fact that more depth was added by having more lively and detailed discussions between the presenters and the attendees by using all of the two hours given each day. In addition, it provided an opportunity for the participants to build networks for future collaboration through active exchange of knowledge and conversations.

On the first day of the sessions, presentations mainly discussed processes related to energy production and carbon dioxide utilization. On the second day, the development, utilization, and analysis of advanced materials were discussed. Some attendees had the opportunity to discuss a variety of topics through a networking dinner after the session.

Although the session titles covered Chemical, Textile, Energy, and Nuclear Engineering, all attendees were found to have obtained a degree in either Chemical Engineering or Energy Engineering. As a result, it was pointed out that the session title was rather broad, which could reduce the interest of conference attendees. In addition, some opinions on how to build a more active network through cooperation with KIChE (Korean Institute of Chemical Engineers) – US Chapter, a professional society of the Korean Chemical Engineers in the US, were presented to build a more active network. In fact, it turns out that four of the presenters are currently active in this organization. Finally, all attendees agreed to make efforts to discuss more diverse topics and allow more people to participate..

4. Group Photos

Mechanical, Aerospace, and Naval Engineering (MAN) Technical Group C-3

Chair

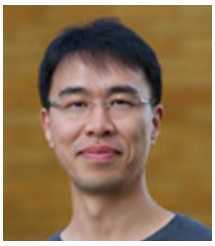
Eon Soo Lee

New Jersey Institute of Technology

Co-chairs

Martin Byung-Guk Jun

Purdue University



W. Jong Yoon

University of Washington Bothell

1. Symposium Description

The Mechanical, Aerospace, and Naval Engineering (MAN) Symposium covers a wide variety of related areas including energy, manufacturing, mechanics, control, robotics, materials and so on. Experimental, theoretical, and computational studies are all welcome to the MAN symposium. The MAN symposium facilitates communication and collaboration on cutting-edge research in mechanical, aerospace, and naval engineering.

2. Sessions (Schedule and Description)

Aug 3 _ Thursday _ 4:00 – 6:00pm

MAN Session I: MAKER-Manufacturing Alliance of Korean Engineers and Researchers
Chair: Martin Jun (Purdue University), Eon Soo Lee (New Jersey Institute of Technology)

Time	Title and Speaker
4:00	**Practical and Economical Additive Manufacturing for High Temperature Applications** Invited // Haseung Chung (Michigan State University)
4:20	**Via Metrology and Inspection for Advanced Electronics Packaging** // Chabum Lee (Texas A&M University)
4:35	**Advanced Manufacturing Techniques for Flexible and Wearable Devices** // Chi Hwan Lee (Purdue University)
4:50	**A Novel Approach of Mold-free Manufacturing for Highly Sensitive Pressure and Tactile Sensors** // Sunghwan Lee (Purdue University)
5:05	**Additive Manufacturing of Rubber** // Jae-Won Choi (University of Akron)
5:20	**Cutting Mechanisms of Cross-ply Carbon Fabrics using a Drag Cutter** // Dae-Wook (Dave) Kim (Washington State University)
5:35	**3D Printed Microchannel-based Blood Plasma Self-separation for Biomedical Applications** // Eon Soo Lee (New Jersey Institute of Technology)
5:50	**Sound Recognition Using MT Connect Framework for Real-time Cutting Condition Monitoring of CNC Milling Machine** // Martin Byung-Guk Jun (Purdue University)

Aug 4 _ Friday _ 4:00 – 6:00pm

MAN Session II: Future Technologies in Materials and Engineering
Chair: Woon Jong Yoon (University of Washington Bothell), Eon Soo Lee (New Jersey Institute of Technology)

Time	Title and Speaker
4:00	**A Study on the Development of Terrain Following Simulator using Digital Terrain Elevation Data (DTED)** Invited // Sangchul Lee (Korea Aerospace University)
4:20	**Decarbonization Effort in Non-Road Heavy-Duty Equipment** // Youngjin Son (Caterpillar Inc.)
4:35	**High Performance Green Composites Made with Cellulose Long Filament and Vanillin Epoxy** // Jaehwan Kim (Inha University)
4:50	**Morphology Control of Inkjet-Printed Micro-Patterns for Printed Electronics** // Jun Young Hwang (Korea Institute of Industrial Technology)
5:05	**Multifunctional Mechano-Luminescence-Optoelectronic Composites for Non-Invasive and Self-Learning Health Monitoring Wearables** // Donghyeon Ryu (New Mexico Tech)

5:20	**Cells Function as Ternary Logic Gates to Decide Their Migration Direction Under Combined Chemical and Fluidic Cues** // Bumsoo Han (Purdue University)
5:35	**Development of Gamifying Robots for Improving Stroke Recovery and Cross-disciplinary Undergraduate Research Experience** // Woon Jong Yoon (University of Washington Bothell)

Aug 4 _ Friday _ 6:00 – 9:00pm

MAN Poster Session

Chair: Martin Jun (Purdue University), Woon Jong Yoon (University of Washington Bothell)

Time	Title and Speaker
MAN P1	**CNN-based Vibration Signal Classification through Image Conversion of Feature Matrix** // Tae Hong Min (Gyeongsang National University)
MAN P2	**Optimal Design Process of Variable Geometry Turbocharger Turbine Impeller** // Jeong-Eui Yun (Kangwon National University)
MAN P3	**Thermal Control in Metal Additive Manufacturing** // Jihoon Jeong (Northwestern University)
MAN P4	**Development of Rule-based Automatic Diagnosis Technology for Motor Pump System Diagnosis** // DeokYeong Cheong (Gyeongsang National University)
MAN P5	**Electrified Personal Tracked Vehicle for Automation** // Santiago Ricoy (University of Nevada, Las Vegas)
MAN P6	**Optimization of Direct Energy Deposition Additive Manufacturing Process for Al-Mg-Si Alloy and H13 Steel** // Jeki Jung (Stevens Institute of Technology)
MAN P7	**Towards Embodiment of Miniature Humanoid through Virtual Reality** // Akshay Dave (University of Nevada, Las Vegas)
MAN P8	**Trajectory Planning for a Cable Driven Parallel Robot** // Zahir Castrejon (University of Nevada, Las Vegas)
MAN P9	**Crack Morphologies during Ultra-Precision Machining of Single Crystal 8 %mol Yttria-stabilized Zirconia** // Dae Nyoung Kim (University of Wisconsin - Madison)
MAN P10	**Method for Real-Time Joint Trajectory in Telepresence Avatar Robotics** // Baekseok Kim (University of Nevada, Las Vegas)
MAN P11	**Contact Guidance of Hs27 Fibroblasts** // Chunghwan Kim (Arizona State University)
MAN P12	**Animated Graphene-filled Glass Fiber Composites for Enhanced Mechanical Properties** // Ning Bian (University of Texas at Dallas)
MAN P13	**Path planning problem for Self-Rechargeable Unmanned Aerial-Ground Vehicle Group** // Jackie Lee (Texas A&M University)
MAN P14	**Waveguided-based Darkfield Microscopy for Wafer Edge Inspection** // Heebum Chun (Texas A&M University)
MAN P15	**Parametric Machine Learning Model for Laser Powder Bed Fusion** //Jong Kim (University of Central Florida)
MAN P16	**Static Analysis of a Carbon Fiber Rotor in an Axial Flux motor** // Joon Jo (Texas A&M University)
MAN P17	**CNN-based Condition Classification of Vibration Signal Considering Fault Location** // Jeongjun Lee (Gyeongsang National University)
MAN P18	**A Novel Approach to Mosquito Trap: Utilizing 3D Flight Tracking Technology** // Soohwan Kim (Georgia Institute of Technology)

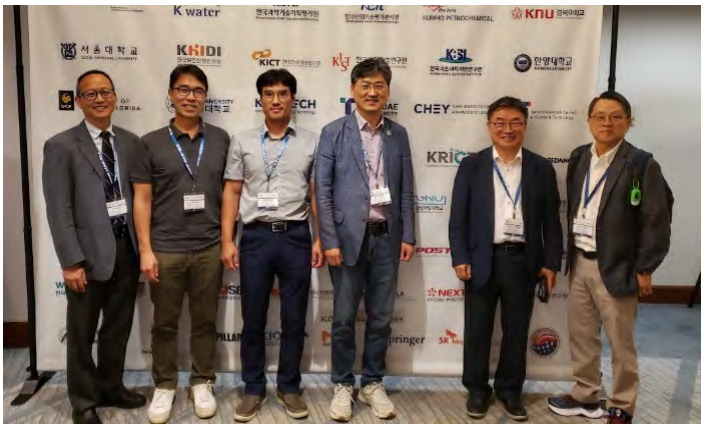
3. Session Recep

The MAN Symposium presented three sessions; two oral sessions and one poster session. Particularly, this year's MAN Symposium allocated one session exclusively for the "*MAKER- Manufacturing Alliance of Korean Engineers and Researchers*" society, to initiate active collaboration and networks for advanced manufacturing communities in both the US and Korea, and to promote the US-Korea international research collaborations and project promotions. Due to the enhanced focused group of session, there were very active and stimulating discussions among presenters and audience through Q&A in the MAKER session for future collaboration. Additionally, the MAKER group initiated a strong discussion for the international collaboration with KIAT (Korea Institute for Advancement of Technology 한국산업기술진흥원) to advance the manufacturing technology of the small- and mid-sized companies in Korea through the technical consultation and advice program of the institution which has a huge potential to bridge US-based scholars with Korean companies. Each oral session was composed of 15 min presentation, including Q&A, per each talk, and 20 min for the Invited talk. All posters were presented in the poster session to the general audience over the full amount of poster session time and to the evaluation panels for poster award.

Overall, the MAN symposium in this year's UKC2023 received a good number of papers submitted from universities in both the US and Korea, particularly with three oral talks and four poster presentations from Korea, which maintained Korea's active involvement. It is also good to note that papers from a Korean national institution (KITECH-Korea Institute of Industrial Technology 한국생산기술연구원) and a company (Caterpillar) were presented in the oral session to cover a broad range of technical backgrounds. Also, it was noticed that one paper was presented in aerospace engineering from Korea as an Invited Talk, to engage more researchers in aerospace engineering from Korea. Friendship and collaboration among the participants were promoted during the networking dinner event.

4. Group Photos

Group photo 1: MAKER group photo with KIAT representatives



Group photo 2: At the end of Networking dinner with MAN Symposium chairs

Group photo 3: From oral sessionstives

Materials Science and Engineering, Nanotechnology (MSE)
Technical Group C-4

Chair

Jiyoung Kim

University of Texas at Dallas

Co-chairs

Chang-Yong Nam

Brookhaven National Laboratory

Jang-Sik Lee

Pohang University of Science and Technology(POSTECH)

1. Symposium Description

Materials innovation is at the heart of addressing critical societal challenges related with energy, environment, and sustainability. Materials Science and Engineering (MSE) symposium will bring together scientists and engineers working at the forefront of materials science and technologies, providing opportunities for gaining new perspectives and networking for future collaborations. The topics to be covered by the symposium include but are not limited to: Electronic materials; functional materials; and nanomaterials towards advanced applications such as micro/nanoelectronics, energy conversion/storage, and additive manufacturing to name a few. Also to be discussed are novel materials design, synthesis, processing, and characterization.

2. Sessions (Schedule and Description)

Aug 3 _ Thursday _ 4:00 – 6:00pm

MSE Session I: Material Synthesis—Electrochemistry and Microelectronics Applications
Chair: Jiyoung Kim (University of Texas at Dallas), Chang-Yong Nam (Brookhaven National Laboratory)

Time	Title and Speaker
4:00	**Electrochemistry of Metals with High Oxidation Potential** Invited // Choong-Un Kim (University of Texas at Arlington)
4:20	**Fabrication of Fe-Ni Invar Alloy using Electrodeposition Technology for FMM Application** Invited // Jae-Ho Lee (Hongik University)
4:40	**3-Dimensional Integration with High Interconnection Density** Invited // Rino Choi (Inha University)
5:00	**Electrochemical Stability of Real-Scale Metallic Nanoparticles explored by Machine Learning** Invited // Hyuck Mo Lee (Korea Advanced Institute of Science and Technology)
5:20	**Electrochemical synthesis of single crystalline nanomaterials and applications to interconnect of electronic packaging** Invited // Jae Yong Song (Pohang University of Science and Technology)
5:40	**Phase-field Simulation of Microstructure Formation in Thin Films** Invited // Yongwoo Kwon (Hongik University)
6:00	**The Role of Nanofillers in Tire Rubber on Noise Reduction under Low-Frequency Vibration** Invited // Hongbing Lu (University of Texas at Dallas)

Aug 4 _ Friday _ 4:00 – 6:00pm

MSE Session II: Next-Generation Electronic Devices and Materials
Chair: Jang-Sik Lee (Pohang University of Science and Technology), Chang-Yong Nam (Brookhaven National Laboratory)

Time	Title and Speaker
4:00	**Technology Trends of 3D NAND Flash Memory and Pathfinding Opportunities** Invited // Tae Kyung Kim (Samsung Electronics)
4:20	**Highly-Scaled 3D Ferroelectric Transistor Array for Compute-in-Memory** Invited // Jang-Sik Lee (Pohang University of Science and Technology)
4:40	**Half-Cycle Interrogation of HfO2 Atomic Layer Deposition Mechanism Using in-situ Reflectance Absorbance Infra-Red Spectroscopy** Invited // Jiyoung Kim (University of Texas at Dallas)

5:00	**Dopant Control of Ultra-short Channel Gate-All-Around FET for Reliable Threshold Voltage** Invited // Rock Hyun Baek (Pohang University of Science and Technology)
5:20	**New Device Applications of III-Nitride Wide-Bandgap Semiconductors: Beyond Power Electronics and Visible/UV Photonics** Invited // Jae-Hyun Ryou (University of Houston)
5:40	**High Resolution Photolithography for OLED Frontplane** Invited // Jeong-Hwan Lee (Inha University)
6:00	**Vapor-Phase Infiltration for Microelectronics Applications** Invited // Chang-Yong Nam (Brookhaven National Laboratory)

Aug 4 _ Friday _ 6:00 – 9:00pm

MSE Poster Session

Chair: Jiyoung Kim (University of Texas at Dallas), Chang-Yong Nam (Brookhaven National Laboratory), Jang-Sik Lee (Pohang University of Science and Technology)

Time	Title and Speaker
MSE P1	**Charge Transfer Across the Interfaces in Organic Field-Effect Transistors** // Hyun Ho Choi (Gyeongsang National University)
MSE P2	**Free-Standing $Li_4Ti_5O_{12}$/Carbon Nanotube Electrodes for Flexible Lithium-Ion Batteries** // Jun seok Lee (Gyeongsang National University)
MSE P3	**The Effects of in-situ Atomic Layer Annealing on Thermal Atomic Layer Deposited Silicon Nitride** // Siun Song (The University of Texas at Dallas)
MSE P4	**Analysis of Separation Behavior of Polyamide Structure-Based RO membrane Using Multi-scale Simulation** // Kwangseop Im (Gyeongsang National University)
MSE P5	**Optimal Print Parameter Prediction By Neural Networks For Laser Powder Bed Fusion Additive Manufacturing** // Kevin Graydon (University of Central Florida)
MSE P6	**Enhanced ferroelectric polarization of $Hf_{0.5}Zr_{0.5}O_2$ thin films through fast ramp-up annealing process** // Seongbin Park (Kangwon National University)
MSE P7	**Forming Voltage-Free Memristive Hafnium Oxide Devices for Non-Polar Switching Applications** // Yeeun Hong (University of Texas at Dallas)
MSE P8	**Characterizing the High Temperature Mechanical Performance and Microstructure of Additively Manufactured Tantalum** // Sharon Park (Johns Hopkins University)
MSE P9	**Determining Printability of Soft Magnetic Alloys Via Single Track Study** // Nicolas Ayers (University of Central Florida)
MSE P10	**Development and evaluation of diaphragm membrane for alkaline water electrolysis** // Sang Yong Nam (Gyeongsang National University)
MSE P11	**Manufacturing of Inconel 718 with Enhanced Boron Composition via Selective Laser Melting** // Jeongwoo Lee (University of Texas Rio Grande Valley)
MSE P12	**Evaluation of Interfacial Property and Damage Sensing of Structural Composites Using Electrical Resistance Method** // Dong-Jun Kwon (Gyeongsang National University)
MSE P13	**Fabrication and Electrical Properties of Organic Ferroelectric Gate Transistors** // Byung Eun Park (University of Seoul)
MSE P14	**Electrochemical Removal of Nitrate for Ammonia Synthesis and Water** // Jeonghoon Lim (Lawrence Berkeley National Laboratory)
MSE P15	**The Effect of H-bonding Strength on the Water-responsiveness of Bacillus subtilis Cell Walls using Hofmeister Salts** // Seungri Kim (City College of New York)

MSE P15	**The Effect of H-bonding Strength on the Water-responsiveness of Bacillus subtilis Cell Walls using Hofmeister Salts** // Seungri Kim (City College of New York)
MSE P16	**[SEED2023] Solvent-Free Synthesis and Modification of Membranes for Industrially Relevant Gas Separations** // Dennis Lee (Johns Hopkins University)
MSE P17	**Compositional Redistribution, Phase Transformation, Microstructural Development in SS316L/IN625 Bimetallic Structure Fabricated by Laser Powder Bed Fusion** // Asif Mahmud (University of Central Florida)
MSE P18	**Enhancing the performance of tungsten-based alloys through additive manufacturing** // Hyeji Im (Northwestern university)
MSE P19	**Cross-Point Array of Metal-Ferroelectric-Metal $HfZrO_2$ Capacitors for Compute-in-Memory Applications** // Minjong Lee (University of Texas at Dallas)
MSE P20	**High endurance of back-end-of-line compatible ferroelectric $Hf_{0.5}Zr_{0.5}O_2$ thin films through low temperature annealing** // Jong Mook Kang (Kangwon National University)
MSE P21	**Computational Design and Analysis of Metal Halide Perovskites: Toward Eco-friendly and Highly Stable Solar Cells** // Ki-Ha Hong (Hanbat National University)
MSE P22	**Effect of Carbon on The Microstructure and Mechanical Properties of Carbon-bearing Steels in Laser Powder Bed Fusion** // Thinh Huynh (University of Central Florida)
MSE P23	**Electronic Transport in Pd-PdH_x $_{(0 \le x < 0.7)}$ Film in Ambient Temperature** // Jong-Hee Park (DePaul University)

3. Session Recep

The UKC 2023 Materials Science and Engineering (MSE) Symposium comprised two oral sessions with 13 presentations (all invited). Each session was dedicated to "*Materials Synthesis—Electrochemistry and Microelectronics Applications*" and "*Next-Generation Electronic Devices and Materials*", respectively. Also held was a poster session with 23 contributed poster presentations, one of the largest numbers in recent past UKCs.

The symposium speakers, from academia, industry, and government laboratory in the US and Korea, discussed the state-of-the-art research topics focused on synthesis, computational modeling, and device fabrication & characterizations related with microelectronics applications, including display, 3D heterogeneous integration, advanced memory devices, wearable devices, and EUV lithography. There were notable high-profile symposium participants, including Prof. Hyuck Mo Lee, the Director General for Basic Research in Science & Engineering of the National Research Foundation of Korea (NRF), Dr. Joonyeon Chang, the Director General of the Korea Institute of Science and Technology (KIST), and Prof. Jehyun Lee, the President of the Korean Institute of Metals and Materials (KIM+).

The lively poster session also covered wide-ranging topics from microelectronics materials to additive manufacturing to various other functional materials. Many of the MSE Symposium attendees participated in the network dinner organized at the venue as well as a restaurant in Korea town, exchanging informative discussions on current and future research & funding landscapes in the US and Korea and future collaboration opportunities.

4. Group Photos

Civil and Environmental Engineering, Architecture (CEA)
Technical Group C-5

Chair

Youngguk Seo

Kennesaw State University

Co-chair

Jung Heum Yeon

Texas State University

1. Symposium Description

The Civil, Environmental, and Architecture (CEA) Engineering Symposium covers diverse engineering and scientific themes every year. At the 36th annual UKC conference, the CEA symposium presents recent advancements in assessing and promoting the resilience of buildings, transportation infrastructure, and the environment. All participants will share and learn new paradigms and perspectives brought by the unprecedented events and many short-lived trends via three technical sessions: toward the sustainable environment; more resiliency for the built infrastructure; and into the future materials and field practices.

2. Sessions (Schedule and Description)

Aug 3 _ Thursday _ 4:00 – 6:00pm

Transport Institute (KOTI) Session: Korea Highway Management Technology and Policy
Chair: Brian Park (University of Virginia)

Time	Title and Speaker
4:00	**Vice President's Welcome Remarks** // Jeehyung Park (KOTI)
4:05	**Scenario Development Methodology for Automated Vehicle Evaluation** Invited // Ilsoo Yun (Ajou University)
4:25	**Digital Transformation of Road Management in Korea** // Chandle Chae (Road Transport Policy of Korea Transport Institute)
4:50	**Introduction of Panelists** // Jeehyung Park (KOTI), Mihyeon Jeon (Atkins), Hanseon Cho (KOTI)
5:10	**Panel Discussion and Q&A**
5:50	**Wrap-up and Group Photo**

Aug 3 _ Thursday _ 4:00 – 6:00pm

CEA Session I: Innovative Ideas in Construction
Chair: John McFadden (FHWA), Co-Chair: Namho Cho (University of Iowa)

Time	Title and Speaker
4:00	**Facility Management Practice for Public University: A case study on the University of Iowa** // Namho Cho (University of Iowa)
4:20	**Towards Portable and Accurate Ergonomic Assessment in Construction** // Ju Hyeong Ryu (West Virginia University)
4:40	**Automated Estimation Model for Liquidated Damages in General Provisions of Equipment Purchasing Orders** // Sea-eun Park (POSTECH)
5:00	[SEED2023] **Virtual Reality Educational Simulation for Construction Management** // Suryeon Kim (Texas A&M University)
5:20	**AI-driven contract risk extraction model** // Jeehee Lee (University of Nevada, Las Vegas)
5:40	**Using Data to Integrate Equity in Infrastructure Project Selection Process** // John McFadden (FHWA)

Aug 4 _ Friday _ 4:00 – 6:00pm

CEA Session II: Natural Disasters: Predictions and Post-damage Assessments

Chair: Min Jae Suh (Sam Houston State University)

Time	Title and Speaker
4:00	**Green Infrastructure Design and Runoff Reduction Evaluation for Metro City Level: The Case Study of Suwon City** // Junsuk Kang (Seoul National University)
4:20	**Assessing Vulnerability of South Korea to Typhoon Damage Considering Sea Level Rise: A Case Study of Typhoon Maesak Simulation** // Jin young Kim (University of Texas at Arlington)
4:40	**Multivariate Frequency Analysis Framework for Hurricane Events and Its Application on Hurricane Ian** // Eunsaem Cho (Florida State University)
5:00	**Event coincidence of dryness, conflict, and forced migration in Somalia** // Woi Sok Oh (Princeton University)

Aug 4 _ Friday _ 4:00 – 6:00pm

CEA Session III: Towards Sustainable and Smart Buildings

Chair: Eul-Bum Lee (GIFT)

Time	Title and Speaker
4:00	**Investigating the Relationship between Human Physiological Responses and Indoor Environmental Quality in Commercial Buildings** // Joon-Ho Choi (University of Southern California)
4:20	**Evaluation of V-COP model for real-time monitoring of EHP performance** // Jihyun Seo (Korea Institute of Energy Research)
4:40	**Fast Load Prediction Model of Chiller using Bayesian Optimization** // Juwan Ha (NC State University)
5:00	**An Empirical Analysis of Korean Household Appliance Use Patterns: using a national Time Use Survey dataset** // Seungmin Lee (NC State University)
5:20	**In-situ evaluation of non-destructive insulation performance measurement method of building envelope** // Daehwan Shin (Korea Institute of Energy Research, KIER)

Aug 4 _ Friday _ 4:00 – 6:00pm

CEA Session IV: Future Mobility

Chair: Mihyeon Jeon (Atkins), Co-Chair: Brian Park (University of Virginia)

Time	Title and Speaker
4:00	**Physics-Informed Neural Network-based Computational Solid Mechanics Model for Problems with Material Heterogeneity** // Hyeeun Kong (Penn State University)
4:30	**Field Evaluation Plan of Connected Vehicle Identification System** // Byungkyu Brian Park (University of Virginia)
5:00	**Common Data Requirements for Digital Twin Data Interoperability in Capital Projects** // John Oh (Texas A&M University)

Aug 4 _ Friday _ 6:00 – 9:00pm

CEA Poster Session
Chair: Jun Kim (Florida Polytechnic University)

Time	Title and Speaker
CEA P1	**Heat Stress Conditions and Awareness of Roofers in South Texas** // Min Jae Suh (Sam Houston State University)
CEA P2	**Fenton-like catalytic ceramic membrane hybrid system for the advanced water treatment** // Youngkun Chung (Rice University)
CEA P3	**Development of Smart Harmful Algal Bloom (HAB) Detection System Using Unmanned Aerial Vehicle (UAV) and Hyperspectral Sensor** // Da Yun Kwon (Korea University)
CEA P4	**Multiple heavy metal detection in greywater using a novel MoS2-chitosan-based electrochemical sensor** // Woo Hyoung Lee (University of Central Florida)
CEA P5	**Purification of Phosphoric Acid Manufacturing Process Water with Recovery of Critical Materials using MCDI** // Jun Kim (Florida Polytechnic University)
CEA P6	**An Electrical Heating Technique for Environmentally Friendly Winter Maintenance of Transportation Infrastructure** // Jung Heum Yeon (Texas State University)
CEA P7	**Pathway to a Just Transition: Bridging Regional Inequality of Clean Energy Through Hydrogen** // Gina Park (Cornell University)
CEA P8	**[SEED2023] Development of On-site Quality Management System for Asphalt Pavement Using IoT**// Dong Hyuk Kim (University of Georgia)
CEA P9	**[SEED2023] Multifunctional Flexible Sensor for Temperature and Strain Detection** // Bo Mi Lee (University of Central Florida)
CEA P10	**Assessment of Thermal Comfort in Response to Urban Spatial Changes** // Seoyoung Lee (Seoul National University)

3. Session Recep

The (CEA) Symposium consists of one special session, four regular technical sessions, and one poster session. The special session is the KOTI session, which kicked off with VP Dr. Jeehyung Park's welcoming remarks. He emphasized the need for discussing highway management strategies and relevant policies. Dr. Chandle Chae (KOTI) presented Digital Transformation and Digital Twins. He noted that the central government made significant efforts, but more efforts are needed from local governments (probably due to funding issues). The research on digital twins is promising for assessing highway management strategies, especially when assessing the impacts of connected automated vehicles on infrastructure improvements. Dr. Ilsoo Yun (Ajou University) presented efforts to reduce field data collection of freeway weaving/merging/diverging cases and methods to generate extreme scenarios to evaluate the impacts of connected automated vehicles. During the panel discussion session, several important points were made. These include the benefits of digitization should be well informed to decision makers. The decision-makers should have reasonable expectations. For example, simply digitizing old roadway design does not help identify the number of lanes and lane assignment. The impact of connected automated vehicles should be properly explored before establishing highway management and policies. In addition, vehicle electrification does have a significant impact on charging stations.

One of the regular technical sessions was centered on Future Mobility, with three presentations. Dr. Brian Park presented mixed traffic cooperative platooning and his plan to conduct a field evaluation of the connected vehicle identification system (CVIS) prototype. He emphasized the benefits of joint adaptive cruise control (CACC) harnessed by connectivity over adaptive cruise control (ACC). He highlighted that his mixed traffic cooperative platooning improves over ACC because it

takes advantage of connectivity. Since identifying connectivity is not trivial, his effort in developing and testing CVIS will help deploy speedy adoption of connected vehicles. John Oh from Texas A&M University presented his team's work on common data requirements for digital twins, especially for data interoperability in capital projects. He gave several associations' data architecture and how to potentially design standard data structures that many digital twin applications and tools can easily share.

Three presenters delivered their work in the session, where topics related to Natural Disasters were shared. Jin Young Kim (University of Texas at Arlington) showed results as a case study of Typhoon Maesak simulation to illustrate the assessment of the vulnerability of South Korea to typhoon damage considering sea level rise. While Eunsaem Cho (Florida State University) presented work on multivariate frequency analysis framework for hurricane events, including Hurricane Ian, Dr. Oh from Princeton University delivered his research on event coincidence of dryness, conflict, and forced migration in Somalia to wrap up the session.

In the session "*Towards Sustainable and Smart Buildings*," five presenters delivered their work from the Investigation of the relationship between human physiological responses and indoor environmental quality in commercial buildings by Joon-Ho Choi (University of Southern California) to an empirical analysis of Korean household appliance use patterns by Seungmin Lee (NC State University). It demonstrated how our efforts to make a living and working environment safe have shifted.

The CEA Poster session was held in Aviation A, where ten posters were displayed with other symposium posters. Notably, graduate students and early career academics engaged with people by asking intriguing questions and suggesting new ideas.

4. Group Photo

Electrical and Computer Engineering (ECE)
Technical Group C-6

Chair

Jin W Choi

Michigan Technological University

Co-chairs

Wookyung Sun

Seoul National University

Jeongwon Park

University of Nevada at Reno

Jungkwun Kim

University of North Texas

1. Symposium Description

The Electrical and Computer Engineering Symposium is designed to provide emerging technologies and diverse developments in a wide range of disciplines of Electrical and Computer Engineering. With the global success of smart devices and the increasing importance of intelligent systems, this symposium provides a platform to introduce the latest innovations as well as showcase applications enabled by these technologies. This symposium brings together scientists and engineers from the US and Korea, promoting the opportunity for technical information exchange and research collaboration between these two vibrant communities. ECE symposium will cover i) electronic and photonic devices, ii) integrated circuits, intelligent systems, control, and networks, iii) emerging applications in healthcare, artificial intelligence, and robotics, and iv) energy, power, and other areas of smart devices and systems.

2. Sessions (Schedule and Description)

Aug 3 _ Thursday _ 4:00 – 6:00pm

ECE Session I: Advancements in Emerging Technologies

Chairs: Jin W Choi(Michigan Technological University), Wookyung Sun(Seoul National University), Jeongwon Park(University of Nevada at Reno), Jungkwun Kim (University of North Texas)

Time	Title and Speaker
4:00	**Fabrication of OLED Lighting Auxiliary Electrode by Self-aligned Inkjet Printing Process** // Sang-Ho Lee (Korea Institute of Industrial Technology)
4:20	**Fully Portable Wireless Soft Stethoscope and Machine Learning for Continuous Real-Time Auscultation and Automated Disease Detection** Invited // W. Hong Yeo (Georgia Tech)
4:40	**Printed Hybrid Electronics** // Donghun Park (3DFlexible Inc.)
5:00	**Self-Rotating Discharge using a Pattered Dielectric Area in Ambient Air and Potential Application in Materials Surface Modification** Invited // Choonsang Park (Milligan University)
5:20	**Lab on a Smartphone (LOS): a smartphone-integrated optoelectrowetting platform as a portable environmental sensor for on-site water quality monitoring** // Sean Park (San Diego State University)
5:40	**Microfabrication of Hollowed Microneedle Array by Diffraction Lithography** // Jungkwun Kim (University of North Texas)

Aug 4 _ Friday _ 4:00 – 6:00pm

ECE Session II: Innovations in Semiconductor and Wireless Technologies

Chairs: Jin W Choi(Michigan Technological University), Wookyung Sun(Seoul National University), Jeongwon Park(University of Nevada at Reno), Jungkwun Kim (University of North Texas)

Time	Title and Speaker
4:00	**Automatic Array Calibration System for Wireless Microwave Power Transmitter** Invited // Sang-Hwa Yi (Korea Electrotechnology Research Institute)
4:20	**5.8 GHz High-power Rectifier using GaN-HEMT diode for wireless Power Transmission Application** Invited // Wonseob Lim (Korea Electrotechnology Research Institute)
4:40	**Energy harvesting power management circuits for dual-battery configuration** Invited // Kyoungho Lee (Korea Electrotechnology Research Institute)

5:00	**An overview of DRAM cell architecture post-Moore law era** // Wookyung Sun (Seoul National University)
5:20	**Plasmon FET for Tailored Photodetection and Bio Sensing** // Sung Jin Kim (University of Louisville)
5:40	**Innovations in Nanoelectronics: Exploring the Possibilities of 2D Materials** // Jeongwon Park (University of Nevada Reno)

Aug 4 _ Friday _ 6:00 – 9:00pm

ECE Poster Session

Chairs: Jin W Choi(Michigan Technological University), Wookyung Sun(Seoul National University), Jeongwon Park(University of Nevada at Reno), Jungkwun Kim (University of North Texas)

Time	Title and Speaker
ECE P1	**Region-based conversion of neural activity across sessions** // Woohyun Eum (University of Florida)
ECE P2	**Effective fetal ECG extraction for non-invasive ambulatory monitoring** // Yongkuk Lee (Wichita State University)
ECE P3	**LED Evaluations for Photovoltaic Impedance Spectroscopy** // Sung Yeul Park (University of Connecticut)
ECE P4	**Evaluation of transient and small-signal stability of Korean power system along the penetration of renewable energy** // Jongoh Baek (Texas A&M University)
ECE P5	**Artificial Neural Network(ANN) Based Maximum Power Point Tracking(MPPT) Algorithm for a Photovoltaic Application** // Woonki Na (California State University, Fresno)
ECE P6	**Fast Recognition of Crop Parts Using 3D Point Clouds and Semantic Segmentation Neural Network** // Young Jae Ryoo (Mokpo National University)

3. Session Recep

The symposium, held on August 3rd and 4th, 2023, comprised two distinct sessions dedicated to the forefront of developments in the Electrical and Computer Engineering field. The event featured a comprehensive program encompassing a total of three sessions, which included a total of 14 presentations, incorporating 5 invited talks, 7 oral presentations, and 2 poster sessions. For the demographic information, 7 talks were from the US and 5 talks were from Korea among the contributed talks, which also include 7 from academia, 4 from research institutes, and 1 from industry. The quality of presentations from invited and oral speakers was consistently impressive. The symposium was a platform that effectively highlighted the most recent advancements and novel innovations spanning emerging technologies, semiconductor devices, wireless communication, and related domains. With a primary focus on the Advancements in Emerging Technologies and Innovations in Semiconductor and Wireless Technologies, the symposium provided a dynamic and inclusive forum for intellectual exchange and collaborative growth.

In addition to the formal sessions, an in-person networking dinner facilitated informal discussions among select symposium participants. This gathering allowed for a diverse range of conversations that spanned materials science, engineering, and the prospects of future technological advancements. Subsequently, participants of the ECE session were afforded further networking opportunities at the Grand Hyatt hotel, reinforcing the collaborative spirit that underpinned the symposium's overarching objectives.

The ECE Technical Symposium, comprising two enlightening sessions, brought together leading experts and researchers to unveil the latest strides in the realms of emerging technologies, semiconductor devices, and wireless communication. The

first session, helmed by accomplished academics, unveiled a spectrum of pioneering developments. These ranged from Sang-Ho Lee's innovative technique for crafting OLED lighting auxiliary electrodes via self-aligned inkjet printing to W. Hong Yeo's cutting-edge wireless soft stethoscope enhanced by machine learning, enabling real-time auscultation and automated disease detection. Donghun Park's presentation on printed hybrid electronics illustrated the fusion of flexibility and printability in electronics, while Choonsang Park introduced the intriguing concept of self-rotating discharge with potential material surface modification applications. Sean Park illuminated the audience with a smartphone-integrated optoelectrowetting platform, facilitating on-site water quality monitoring, and Jungkwun Kim concluded the session with a profound study on microfabrication of hollowed microneedle arrays through diffraction lithography.

The second session, guided by the same adept chairpersons, delved into the realm of semiconductor innovations and wireless technologies. Sang-Hwa Yi's presentation explored an automatic calibration system for wireless microwave power transmitters, enhancing efficiency in wireless power transmission. Wonseob Lim delved into the creation of a high-power rectifier using GaN-HEMT diodes for potential applications in wireless power transmission. Kyoungho Lee enlightened the audience with energy harvesting power management circuits for dual-battery configurations, underlining the importance of sustainable energy solutions. Wookyung Sun provided a comprehensive overview of DRAM cell architecture in the post-Moore's law era, shedding light on the evolving landscape of memory technologies. Sung Jin Kim's presentation on plasmon field-effect transistors for customized photodetection and bio-sensing showcased the convergence of nanotechnology and biomedicine. The symposium came to a fitting close with Jeongwon Park's discourse on the utilization of 2D materials in nanoelectronics, hinting at an exciting future for electronic devices.

The ECE Technical Symposium epitomized a convergence of innovative minds, offering a platform for the exchange of transformative ideas and insights. Through these presentations, discussions, and collaborations, the symposium encapsulated the pioneering spirit driving progress in electrical and computer engineering, promising a future laden with ingenious solutions and unprecedented possibilities. It is highly anticipated to have collaborations among the US and Korea researchers in coming years.

4. Group Photo

Computer and Information Sciences (CIT)
Technical Group C-7

Chair

Ohbong J. Kwon

New York City College of Technology

Co-chairs

Hoyoung Hwang

Hansung University

Donghoon Kim

Arkansas State University

1. Symposium Description

The Computer Sciences and Information Technologies (CIT) symposium encompasses diverse areas of research and development in CS/IT fields as well as the arts and social sciences. The symposium also provides variety of opportunities to emerge entertainment and other technology related areas such as connected vehicles, smart city and bio-medical. The symposium also provided a unique venue for CS/IT researchers and engineers from both academia and industry in the US and Korea. The topics include artificial intelligent, machine learning, data science, connected vehicles, augmented reality/virtual reality, art technology, software engineering, human computer interaction, big data and data analytics, Internet of Things (IoT), cybersecurity, robotics and computer educations. The CIT Symposium consists of regular sessions and poster session.

2. Sessions (Schedule and Description)

Aug 3 _ Thursday _ 4:00 – 6:00pm

CIT Session I: Artificial Intelligence (AI) and Machine Learning (ML)
Chair: Ohbong Kwon(New York City College of Technology), Co-Chair: Hoyoung Hwang (Hansung University)

Time	Title and Speaker
4:00	**Gated Transformer Networks for Drug Classification using MultiDimensional Time-Series Animal Behavioral Data** Invited // Sung-Cheol Kim (PsychoGenics)
4:20	**Cloud-based Integrated Development Environment to Improve Hands-on Activities in a Mobile App Course** // Sam Chung (City University of Seattle)
4:40	**Skyscraper Games for Kids: Lessons Learned from a STEM Contest for Kids** // Frank Lee (Drexel University)
5:00	**Disadvantaged Business Enterprise (DBE) Program Fraud Detection using Natural Language Processing** // Jay Jaeshik Shin (Seoul National University)
5:20	**Enhanced Deep Learning Model for Structural Damage Identification via Random Vibration** // Jongyeop Kim (Georgia Southern University)
5:40	**A Comparative Study of PWAs and React Native Mobile Apps** // Sam Chung (City University of Seattle)

Aug 4 _ Friday _ 4:00 – 6:00pm

CIT Session II: Security
Chair: Ohbong Kwon (New York City College of Technology), Co-Chair: Donghoon Kim (Arkansas State University)

Time	Title and Speaker
4:00	**Integrating Geographic Information Systems and Automatic Identification Systems for Maritime Logistics** Invited // EunSu Lee (New Jersey City University)
4:20	**A Case Study of Next.js's Hybrid Rendering vs. React.js' Client-Side Rendering** // Shingo Kise (City University of Seattle)
4:40	**Enhanced Real-Time Fingerprinting Attacks on Tor Networks** // Donghoon Kim (Arkansas State University)

5:00	**Hierarchical Reinforcement Learning Architecture to Deal With Multi-Horizon Complex Systems** // Prasad Nethala (Texas A&M University-Corpus Christi)
5:20	**Hippocampus Inspired Cognitive Architecture (HICA) for Few-shot Learning** // Deokgun Park (University of Texas at Arlington)
5:40	**Machine Learning Algorithm: Predicting the Price of Soybean** // Soon-Ok Park (Governors State University)

Aug 4 _ Friday _ 6:00 – 9:00pm

CIT Poster Session

Chair: Ohbong Kwon (New York City College of Technology), Co-Chair: Jeongkyu Lee (Northeastern University)

Time	Title and Speaker
CIT P1	**Science and Engineering Education using Drone** // Jounsup Park (California Baptist University)
CIT P2	**Analysis of Community Connectivity in Spatial Transcriptomics Data** // Kyeong Joo Jung (The Ohio State University)
CIT P3	**Potential Transformative Impact of Flood Service Drones** // Jae Hyeon Ryu (University of Idaho)
CIT P4	**Conceptualizing Information Drone to Benefit Underserved People** // Jae Hyeon Ryu (University of Idaho)
CIT P5	**Resource-Efficient Parameter Tuning in Text-to-Speech Models** // Chan Gi Hong (Gwangju Institute of Science and Technology)
CIT P6	**Investigating the cause of selection by using an evolutionary model that incorporates amino acid physicochemical properties** // Hannah Kim (Temple University)
CIT P7	**Evaluating Autoencoder Structures for Testing Location Integrity** // Jinpyo Kim (Texas A&M University-Commerce)

3. Session Recep

The UKC 2023 Computer Sciences and Information Technologies (CIT) Symposium has marked a significant convergence of diverse research and development areas within the realm of Computer Science and Information Technology. With a unique blend of disciplines spanning arts, social sciences, and technological innovation, the symposium showcased cutting-edge advancements while fostering cross-disciplinary collaboration and knowledge exchange. The event not only highlighted the latest trends and breakthroughs in CS/IT but also delved into emerging fields like connected vehicles, smart cities, and bio-medical technologies.

The CIT Symposium was a testament to the expansive scope of computer sciences and information technologies, encompassing a wide array of topics that are pivotal in today's rapidly evolving technological landscape. Researchers, engineers, and experts from academia and industry, hailing from both the United States and Korea, congregated to present and discuss their work in 2 comprehensive sessions featuring 12 insightful talks with 2 invited speakers. Additionally, 7 poster presentations added depth to the symposium, allowing participants to engage directly with the research and its implications. The CIT Symposium resonated with participants, sparking profound discussions and inspiring a collective recognition of the necessity for interdisciplinary research. The convergence of fields like artificial intelligence, machine learning, cybersecurity, and education underscored the symbiotic relationship between diverse disciplines within the realm of CS and IT. The symposium's success has paved the way for exciting future directions and areas of focus. Several notable recommendations and insights emerged from the discussions:

• Education and AI Integration: The demand for education and artificial intelligence integration in the domains of Computer Science, Information Technology, and Information Systems was palpable. Participants passionately advocated for the establishment of dedicated sessions exploring education and workforce development, facilitating a deeper understanding of how AI can reshape learning and professional growth.

• Interdisciplinary Sessions: Building on the symposium's interdisciplinary ethos, there is a growing consensus on the need to expand the breadth of sessions to encompass a broader spectrum of related topics both within and beyond CS and IT fields. By fostering interdisciplinary collaborations, the symposium aims to fuel innovative cross-pollination of ideas and expertise.

• Technology Transfer and Commercialization: Recognizing the potential of research breakthroughs to translate into tangible commercial products, participants underscored the importance of enhanced technology transfer and collaborations between university labs and industry. This transition from academia to real-world applications promises to bridge the gap between innovation and marketable solutions.

The Computer Sciences and Information Technologies (CIT) Symposium was a resounding success. The symposium's multifaceted approach, blending technology with arts, sciences, and societal needs, showcased the transformative power of collaboration and innovation. As the symposium paves the way for future endeavors, it is poised to remain a beacon of inspiration for researchers, engineers, and visionaries driving the forefront of technological progress.

4. Group Photo

Industrial, Manufacturing, and Systems Engineering, Management Sciences, Operations Research (IMS)
Technical Group C-8

Chair

Jeong Hoon Choi

Youngstown State University

Co-chairs

Tai-Woo Chang

Kyonggi University

Hyesung Park

Georgia Gwinnett College

1. Symposium Description

The Industrial Engineering and Management Science (IMS) Symposium aims to discuss recent theoretical advancements and practical developments in the areas of industrial and systems engineering, management science, and supply chain management. The symposium would disseminate, to all branches of academy and industry across the U.S. and Korea, the most relevant theoretical research as well as applications. Topics include, but are not limited to: Intelligent Systems, Internet of Things (IoT), Supply Chain Risk Management, Service Science, Revenue Management, Finance Technology, Artificial Intelligence and Big Data Analytics, Optimization, Network Science, Transportation Science & Logistics, System Simulation, Modeling & Decision Analysis, Quality & Reliability Engineering, Engineering Economic Analysis, and Ergonomics & Human Factors.

2. Sessions (Schedule and Description)

Aug 3 _ Thursday _ 4:00 – 6:00pm

IMS Session I: Health Care and Sustainability

Chair: Hyesung Park (Georgia Gwinnett College)

Time	Title and Speaker
4:00	**The Impact of Misinformation on Health Interventions to Prevent the Spread of Covid-19 in Eastern and Southern Africa** Invited // Sang-Heui Lee (Pittsburg State University)
4:20	**Strategic Capacity Management for Deferred Surgeries** // Eojin Han (Southern Methodist University)
4:40	**Renewable-Battery Hybrid Power Plants in Congested Electricity Markets: Implications for Plant Configuration** // Hyungkwan Kim (Lawrence Berkeley National Laboratory)
5:00	**Challenges in Managing Workload and Anxiety in Gateway Programming Courses** // Hyesung Park (Georgia Gwinnett College)
5:20	**The Vulnerability of the Blood Supply Chain in the U.S.** // Jeong Hoon Choi (Youngstown State University)
5:40	**Proposal of a Parametric-based Generative Design Tool for Customized Mouse** // Eui-Chul Jung (Seoul National University)

Aug 4 _ Friday _ 4:00 – 6:00pm

IMS Session II: Industrial Engineering & Management Science Applications

Chair: Jeong Hoon Choi (Youngstown State University)

Time	Title and Speaker
4:00	**Leveraging Smart Contracts for Secure and Asynchronous Group Key Exchange Without Trusted Third Party** Invited // Junggab Son (University of Nevada, Las Vegas)
4:20	**Safe Drilling Depth for Deep Hole Bone Drilling** // JuEun Lee (University of the Pacific)
4:40	**Inventory and firm performance analysis in the pharmaceutical industry** // Sangdo Choi (o9 Solutions, Inc.)
5:00	**Does corporate political advocacy harm your offline business?** // Yeohong Yoon (Emory University)
5:20	**Exploring the impact of the working capital in the U.S. aviation industry for profitability and shareholder value** // Seock-Jin Hong (University of North Texas)

5:35	**The Impact of Context and Environment on Driver's Situation Awareness** // Sami Park (University of Washington)
5:50	**A Drill-Down Demand Analysis of Beef and Hay Consumption in Korea**// Eunsu Lee (New Jersey City University)

Aug 4 _ Friday _ 6:00 – 9:00pm

IMS Poster Session

Chair: Tai-Woo Chang (Kyonggi University), Jeong Hoon Choi (Youngstown State University)

Time	Title and Speaker
IMS P1	**Prediction and Integrated Control System for the Spread of Hazardous Materials in Industrial Areas** // Minho Son (Podo Institute of Technology)
IMS P2	**Analysis of the Relationship between Innovation Activities and Profitability in Banking Industry in Korea** // Sooyeon Lim (Seoul National University)
IMS P3	**Examining the transfer of ACC training to mental models after an OTA update of Advanced Driver Assistance Systems** // Jimin Kim (University of Iowa)

3. Session Recep

The UKC 2023 Industrial Engineering and Management Science (IMS) Symposium was held in person and comprised two sessions with a total of 13 oral presentations and three poster presentations. Therefore, the symposium had two oral presentation sessions (on Aug 3 and 4 respectively) and one poster presentation session (on Aug 4). Due to various reasons, four speakers could not make it to the conference in person and delivered their talks via recorded presentations. The symposium was a great success, disseminating the most relevant theoretical and practical research to all branches of academia and industry across the U.S. and Korea.

The symposium was mainly intended to discuss recent theoretical advancements and practical developments in the areas of industrial engineering, systems management, and management science. We had an in-person networking dinner among some of the symposium participants, exchanging informal discussion on wide-ranging topics of industrial engineering and management science as well as future contributions to the conference.

Following the theme of the conference, Discovery, Innovation and Dissemination for Transformative Impact, the topic of the first IMS session was "health care and sustainability". In the second session, with the topic set as "*Industrial Engineering and Management Science Applications*", presenters shared their research about trendy topics in the industrial engineering and management science area. Most presenters presented their research in person, while the session chair played the pre-recorded presentations for a few presenters who did not make it to the conference.

The participants find that an in-person conference meeting can help identify and implement collaborations among researchers. We also find that the IMS symposium could potentially grow with more participants. We appreciate the time and efforts of all participants in the successful presentation sessions of IMS.

4. Group Photos

Social Sciences (Anthropology, Economics, Political Science, Sociology, Public Policy, etc.), Psychology, Digital Arts, STEM Education, and Other Sciences (SSP)
Technical Group D-1

Chair

Jongpil Cheon

Texas Tech University

Co-chairs

Nicholas D. Hartlep

Berea College

Kyungbin Kwon

Indiana University Bloomington

Gilbert Park

Ball state University

1. Symposium Description

The Education Research, STEM, and Social Sciences Symposium is organized by KAERA (Korean-American Educational Researchers Association) to invite leading experts and young researchers in emerging technology and DEI (Diversity, Equity, and Inclusion) in Education.
The first session focuses on the integration of advanced technologies into education. These advances brought changes in the way we learn and teach thereby significantly transforming the educational landscape. With this in mind, it will cover a wide range of topics, including but not limited to the ethical implications of AI technology in education, immersive learning experiences through AR or VR, online or flipped learning, gamification, as well as various pedagogies and teaching models.
The second session explores the topic of Diversity, Equity, and Inclusion in STEM education with a focus on Belonging for Koreans and Korean Americans. This session will bring together a group of teacher educators who are doing innovative work in DEI + Belonging. The presentations will focus on issues of DEI+B within the field of STEM teacher education. Topics will include anti-racist pedagogy, cultivating a sense of belonging in the classroom, and unpacking the differences between equity and equality to promote safe learning and teaching environments.

2. Sessions (Schedule and Description)

Aug 3 _ Thursday _ 4:00 – 6:00pm

SSP Session I: Education and Social Science (Integration of Advanced Technology)
Chair: Jongpil Cheon (Texas Tech University), Kyungbin Kwon (Indiana University - Bloomington)

Time	Title and Speaker
4:00	**Embodied Learning for Computational Thinking** // Kyungbin Kwon (Indiana University – Bloomington)
4:15	**Solar Tree for Science, Technology, Engineering, Art, and Math** // Sung Yeul Park (University of Connecticut)
4:30	**Developing AI Chatbot System for Self-Regulated Learning** // Hyangeun Ji (Temple University), Insook Han (Korea University)
4:45	**Unraveling the Effective Teaching and Learning Strategies for Korean College Students in STEM Majors in the COVID-19 Era** // Seong Ji Jeong (The Ohio State University)
5:00	**PROJECT ADAPT – Uncovering the Potential of Arts-Integrated Digital Literacy Professional Development Program in Preservice Teachers' Digital Literacy Development and Learning Engagement** // Jewoong Moon, Kathryn O'Harra, Julianne Coleman, Kelley Schoger, Julie Bannerman (The University of Alabama)
5:15	**Exploring Strategic Differences in Debugging Between Two Groups with Different Levels of Computational Thinking Competency: Implications for Teaching Strategies** // Eunsung Park (Tennessee Tech University), Jongpil Cheon (Texas Tech University)
5:30	**Utilizing Artificial Intelligence for Personalized Career Development** // Boong Yeol Ryoo (Texas A&M University)
5:45	**Enhancing Science Affinities through a Video Project in a Science, Technology, and Society (STS) Learning Approach** // Jiyoon Yoon (University of Texas Arlington), Amanda Olsen (University of Missouri Columbia)

Aug 4 _ Friday _ 4:00 – 6:00pm

SSP Session II: Education and Social Science (Diversity, Equity, and Inclusion)
Chair: Nicholas D. Hartlep (Berea College), Gilbert Park (Ball State University)

Time	Title and Speaker
4:00	**Virtual Cultural Science Night with Academic Coaching** // Jiyoon Yoon (University of Texas Arlington)
4:20	**Synchronous Online Culturally Responsive Academic Tellers and Educational Supporters (SOCRATES) for Online Academic Coaching** // Jiyoon Yoon (University of Texas Arlington), Kate Koo (University of Georgia)
4:40	**The Anti-Racism Conundrum: Measuring Campus Progress** // Katherine S. Cho (Loyola University Chicago)

Aug 4 _ Friday _ 4:00 – 6:00pm

SSP Session II: Education and Social Science (Diversity, Equity, and Inclusion)
Chairs: Nicholas D. Hartlep (Berea College), Gilbert Park (Ball State University)

Time	Title and Speaker
5:00	**Culturally Responsive Computer Science Learning: Fostering Equity and Engagement for Minoritized High School Students** // Jung Won Hur (Auburn University), Jay Bhuyan (Tuskegee University)
5:20	**What Barriers Are Preventing Asian/Americans from Leading Educator Preparation Programs (EPPs)?** // Nicholas D. Hartlep (Berea College), Gilbert Park (Ball State University)

Aug 4 _ Friday _ 6:00 – 9:00pm

SSP Poster Session
Chairs: Jongpil Cheon (Texas Tech University), Kyungbin Kwon (Indiana University - Bloomington), Nicholas D. Hartlep (Berea College), Gilbert Park (Ball State University)

Time	Title and Speaker
SSP P1	**Designing Drone-based STEM Instruction for Formal Spaces** // Hannah Ziegler (Vanderbilt University), Jae Ryu (University of Idaho)
SSP P2	**Development and Dissemination of Instructional Modules for Engineering Lab Writing** // Dave Kim (Washington State University)
SSP P3	**Building Inclusive and Just Pathways to a Clean Energy Economy Through Youth Education of Clean Energy** // Hyun Jin Kim, Hyunjung Ji, Sally Shettles, Mark Mueller (The University of Alabama), Amelia Salazar (Sam Houston State University), Laurel Holmes (Energy Alabama)
SSP P4	**Thermofluid Sciences for Elementary School Students via Flow Visualization Using Smartphones and Tablets** // Hyun Jin Kim, Shemai'ya Peak, Frances Buntain, Jale Ercan Dursun, Jee Suh, Celestia Morgan (The University of Alabama)
SSP P5	**Utilizing the Medium of Virtual Reality to Teach How To Recycle** // Nathan Kassai, Paul Y. Oh (University of Nevada, Las Vegas)
SSP P6	**A Case Study of Recreation-based STEM Education that Improves Unplugged Coding Education Using Musical Activities for Kindergarten Children** // Wonil Chung (Kyung Pook National University), Min Jae Park (Institute of STREAM Academy)

3. Session Recep

The UKC 2021 D-1 Education Research, STEM, and Social Science (SSP) Symposium is organized by KAERA (Korean-American Educational Researchers Association) that is a newly joined affiliated professional society to KSEA. It is the first symposium focusing on educational research in UKC history, and there were two sessions with 13 oral presentations and 6 poster presentations.

The first session brought together scholars and professionals from the education and engineering sectors to delve into the integration of advanced technologies in education. Despite two absent presenters, six outstanding studies were presented, each showcasing innovative approaches toward education. These included an augmented reality learning system, an AI chatbot, and the integration of art into digital literacy. There were also meaningful discussions regarding students' debugging strategies and the effectiveness of flipped learning during the COVID-19 pandemic. Notably, two engineering scholars presented their perspectives, highlighting concepts like artificial trees with solar panels and video games projected onto building surfaces. The symposium facilitated vibrant interactions among participants, encouraging the exchange of experiences and knowledge related to technology in education. Overall, the event provided a platform for envisioning collaborative solutions at the intersection of pedagogy and technological advancement, fostering a renewed enthusiasm for shaping the future of education.

The second session explored the topic of Diversity, Equity, and Inclusion (DEI) with a focus on Belonging for Koreans and Korean Americans. Since only three presentations were given due to two absent presenters, we had the opportunity to introduce all participants along with their affiliations and research interests. The presenters shared research studies on a culturally responsive computer science curriculum for minoritized high school students, the progress of anti-racism efforts on campus, and the barriers faced by Asian American scholars in educator preparation programs. Following the presentations, we had an in-depth discussion about future research related to DEI. During the subsequent poster session, three posters were displayed, and the presenters shared their research projects on VR education for recycling and recreation-based STEM education for kindergarten students.

This symposium provided an opportunity for scholars to share various research studies in the field of education at UKC conference 2023. However, there was a lack of recognition from the central administration of the conference and limited networking opportunities with other fields. It is recommended that Future SSP symposium sessions cover different eras in education and provide more exposure to other technical groups to enhance collaboration further.

4. Group Photos

IES (Innovation and Entrepreneurship Symposium) Report

Innovation and Entrepreneurship Symposium (IES) Report

The Korean-American Scientists and Engineers Association (KSEA) hosted the 5th Innovation and Entrepreneurship Symposium (IES), took place on August 3-5, 2023 at the Hyatt Regency DFW in Dallas, TX. This symposium was designed to facilitate networking opportunities for entrepreneurial communities from both the US and Korea. The IES Demo session provided a platform for participating startups to showcase their companies to UKC attendees and an opportunity for advancing to the Startup Pitch Competition (SPC), a highlight of the symposium, offering the chance to pitch their companies to potential investors and industry professionals while competing for a cash prize. The Idea Pitch Competition (IPC) invited early-stage startups and future entrepreneurs to present their ideas and receive feedback from participating investors. The IPC offered great opportunities to meet future collaborators and seed investors and to compete for cash awards. About 60 people attended the IES sessions and SPC on average for the three days, with about 120 who attended the IES networking dinner and the SPC networking lunch. Throughout the symposium, attendees enjoyed the chance to participate in various networking events with investors, successful entrepreneurs, funding agencies, and experts in law and finance.
The IES 2023 hosted 5 major events: **(1) Workshop, (2) Idea Pitch Competition and Startup Pitch Competition, (3) 1-on-1 mentoring session, (4) Startup Demo, and (5) Networking events**.

The IES began with a keynote speech presented by Mr. Dong Hoon Lee, the CEO of SK Biopharmaceuticals Co. Ltd. & SK Life Sciences, Inc. Mr. Lee delivered inspiring messages as a serial angel investor and mentor to the IES attendees. He introduced core values for the success of a startup journey, using real-world examples from several unicorn cases that he has invested in.

Figure 1. Keynote speech by CEO Dong Hoon Lee of SK Biopharmaceuticals at the opening session of the IES 2023.

1. Organizing Committee

Below shows the members of the IES Committee who prepared for the event for the past five months having about 11 Committee meetings and numerous small-group discussions.

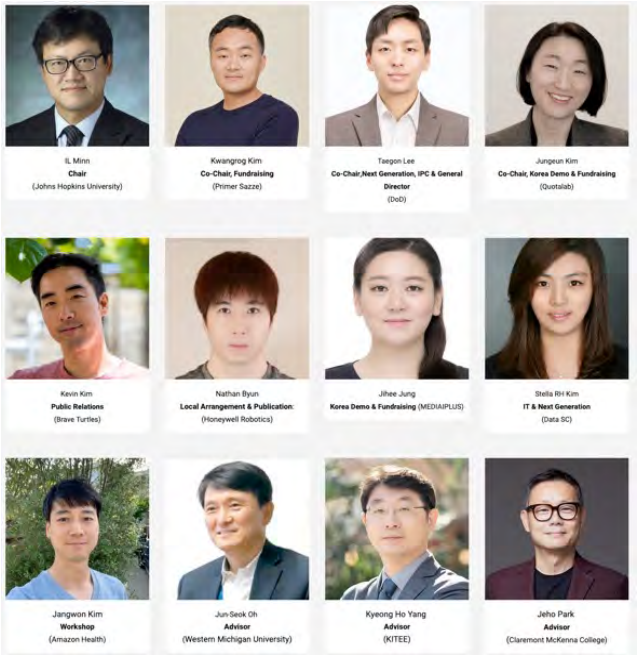


Figure 2. Photo of the organizing committee

Chair & Co-Chairs
IL Minn (Chair, Johns Hopkins University)
Kwangrog Kim (Co-Chair, Fundraising, Primer Sazze)
Taegon Lee (Co-Chair, Next Generation & SPC)
Jungeun Kim (Co-Chair, Korea Demo & Fundraising, Quotalab)
Workshop Committee: Jangwon Kim (Amazon Health), IL Minn (Johns Hopkins University)
Startup Demo, SPC, and IPC Committee: Kwangrog Kim, Jungeun Kim (Quotalab), Taegon Lee (DoD), Jihee Jung, Nathan Byun
Public Relation Director: Kevin Kim (Brave Turtles)
Next Generation Director: Taegon Lee (DoD)
Local Arrangement & Publication Director: Nathan Byun (Honeywell Robotics)
IT Director: Stella RH Kim
General Director: Taegon Lee (DoD)
Advisors: Jun-Seok Oh (Western Michigan University), Kyungho Yang (KITEE), Jeho Park (Claremont McKenna College)

Figure 3. Flyer of the IES and SPC at UKC 2023

2. IES 2023 Program

August 3, 2023 (Thursday)

IES Closed Session (13:30 – 15:30), Enterprise Ballroom 7

- 1-on-1 coaching with investors, successful entrepreneurs, and attorneys.

IES Opening Session (16:00 – 17:00), Enterprise Ballroom 7

Moderator: Jennifer Cho. PhD

- Opening Remarks – IL Minn, PhD, IES 2023 Chair
- Congratulatory Remarks – Yongho Sohn PhD, KSEA President
- IES Keynote: "*The role and prospects of tech start-ups in the era of global tech wars*"
  Dong Hoon Lee, CEO, SK Biopharmaceuticals Co. Ltd. & SK Life Sciences, Inc.

AI and Entrepreneurship (17:00 – 18:00), Enterprise Ballroom 7

Panel Discussion: The impact of generative AI

Moderator: Jangwon Kim, PhD, (Sr. Applied Scientist, Amazon)

- Panelists:
    - John Lee: Head of AI Engineering, Software Engineering Institute, CMU
    - Chang Kim: Former Co-founder & CEO, Tapas Media

August 4, 2023 (Friday)

IES Closed Session (13:30 – 15:30), Enterprise Ballroom 7

Idea Pitch Competition.

Moderator: Jennifer Cho. PhD

IES Startup Pitch Session (16:00 – 18:00), Enterprise Ballroom 7

Moderator: Jennifer Cho. PhD

- 10 invited startups presented.

IES Networking Dinner (18:30 – 20:30), Enterprise Ballroom 7

IES Networking Gathering (20:30 – 23:00), Presidential Suite

August 5, 2023 (Saturday)

Startup Pitch Competition 1 (08:00 – 10:00), Enterprise Ballroom 7

Moderator: Jennifer Cho. PhD

- 10 finalists competed.

UKC Closing and Award Ceremony (10:30 – 12:30), Enterprise Ballroom 1, 2, 3 & 4

SPC Networking Lunch (13:00 – 14:00)

3. 1-on-1 Mentoring Session

10 mentors from varying specialties ran four 30-minute mentoring sessions with startups participating the SPC and IPC. Details for our mentors can be found at IES 2023 website.

Table 1. List of mentors

Mentor Name	Mentor Title	Mentoring Area
Byun, Nathan	Automotive & Robotics, Private Investor	Business Operation (Automobile and Robotics)
Huh, Charlie	Digital Entertainment Tech Startup Executive	Marketing & Growth
Jung, JiHee	Founder, Mediaiplus	Pitch Presentation. Dos & Don'ts as a Startup CEO
Kang, Byoung Jo (BJ), esq	Founder of B.J. Kang Law, PC	US Law, Taxation, & Incorporation
Kim, Greg (Kwangrok)	Partner & Co-Founder, Primer Sazze	Fundraising & Business Strategy
Kim, Kevin	Founder & CEO of BraveTurtles Inc.	Pitch Presentation
Kim, Jung-Eun	Former Director of Customer Success in Quotalab Inc.	Startup Governance
Kim, Se-Hwang	COO, ATTRAKT USA, Managing Partner at MVLASF	Fundraising, Pitch Presentation, Marketing
Koh, Kyunghwan	CEO, DNA Corporation	ESG, Impact (Social Venture), & Business Strategy
Son, Gina	Investment Associate, KDB Silicon Valley	Fundraising & Communication with investors

Table 2. Mentoring Schedule

Mentee	Mentor 1 (13:30-14:00)		Mentor 2 (14:00-14:30)		Mentor 3 (14:30-15:00)		Mentor 4 (15:00-15:30)	
	Name	Mentoring Area	Name	Mentoring Area	Name	Mentoring Area	Name	Mentoring Area
Deep Anchor Solutions	Huh, Charlie	Marketing & Growth	Jung, JiHee	Pitch Presentation, Dos & Don'ts as a Startup CEO	Kim, Greg (Kwangrok)	Fundraising & Business Strategy	Kim, Kevin	Pitch Presentation
GHENUS BIO	Son, Gina	Fundraising & Communication with investors	Kim, Se-Hwang, MusD	Fundraising, Pitch Presentation, Marketing	Kim, Jung-Eun, MS	Startup Governance	Byun, Nathan	Business Operation (Automobile and Robotics)
RD Health Sensing	Kim, Se-Hwang, MusD	Fundraising, Pitch Presentation, Marketing	Koh, Kyunghwan	ESG, Impact (Social Venture), Business Strategy	Huh, Charlie	Marketing & Growth	Son, Gina	Fundraising & Communication with investors
Drop Wireless, Inc.	Kang, Byoung Jo (BJ), esq	US Law, Taxation, & Incorporation	Kim, Greg (Kwangrok)	Fundraising & Business Strategy	Koh, Kyunghwan	ESG, Impact (Social Venture), Business Strategy	Kim, Jung-Eun, MS	Startup Governance

LN Robotics	Byun, Nathan	Business Operation (Automobile and Robotics)			Kang, Byoung Jo (BJ), esq	US Law, Taxation & Incorporation	Kim, Se-Hwang, MusD	Fundraising, Pitch Presentation, Marketing
Snoov			Kim, Jung-Eun, MS	Startup Governance	Kim, Se-Hwang, MusD	Fundraising, Pitch Presentation, Marketing	Jung, JiHee	Pitch Presentation, Dos & Don'ts as a Startup CEO
SH	Jung, JiHee	Pitch Presentation, Dos & Don'ts as a Startup CEO			Byun, Nathan	Business Operation (Automobile and Robotics)	Huh, Charlie	Marketing & Growth
KWell Healthcare			Kang, Byoung Jo (BJ), esq	US Law, Taxation, & Incorporation	Son, Gina	Fundraising & Communication with investors	Kim, Greg (Kwangrok)	Fundraising & Business Strategy
AUTO	Koh, Kyungh-wan	ESG, Impact (Social Venture), Business Strategy	Kim, Kevin	Pitch Presentation			Kang, Byoung Jo (BJ), esq	US Law, Taxation, & Incorporation
Force Feedback Inc. (provisional)	Kim, Jung-Eun, MS	Startup Governance	Huh, Charlie	Marketing & Growth	Jung, JiHee	Pitch Presentation, Dos & Don'ts as a Startup CEO		
HomeVitals	Kim, Greg (Kwan-grok)	Fundraising & Business Strategy	Byun, Nathan	Business Operation (Automobile and Robotics)	Kim, Kevin	Pitch Presentation		
Career Changer Alumni	Kim, Kevin	Pitch Presentation	Son, Gina	Fundraising & Communication with investors			Koh, Kyunghwan	ESG, Impact (Social Venture), Business Strategy

Figure 4. 1-on-1 mentoring session at IES 2023

4. IES Workshop: Panel Discussion on *The impact of generative AI*

Moderator: Jangwon Kim, PhD, (Sr. Applied Scientist, Amazon)

- Panelists:
  - o John Lee: Head of AI Engineering, Software Engineering Institute, CMU
  - o Chang Kim: Former Co-founder & CEO, Tapas Media

Figure 5. Panel Discussion

5. IES Startup Pitch Competition (SPC) and Idea Pitch Competition

As a continued effort to promote and enrich the KSEA members' entrepreneurship, KSEA hosted an Idea Pitch Competition (IPC) and a Startup Pitch Competition (SPC) on August 4 and 5, 2023, respectively, during the UKC 2023. Among the many applicants from the US and Korea in various fields including biotech, AI applications, mobile apps, and online services, the panel of judges selected 10 finalists in each category (IPC and SPC). The finalists are shown in Table 3 and 4 for IPC and SPC, respectively.

Table 3. List of the IPC Finalists

Name of Company	Area of Business	Country
iNNO MeDevice, Inc.	Biomedical	USA
SH	Device	USA
MetaForce	Device	USA
KWell Healthcare	Biomedical	USA
Advanced Urban-mobility Technology Operations (AUTO)	Automobile	USA
Pockette	Other	USA
Force Feedback Inc	Device	USA
Snoov	Device	Korea
HomeVitals	Health Services	USA
Career Changer Alumni	Information Technology	USA

Table 4. List of the SPC Finalists

Name of Company	Area of Business	Country
GHENUS Bio	Device	USA
Deep Anchor Solutions LLP	Other	USA
RebuilderAI	Autimobile	Korea
Osteogen Bio	Biomedical	USA
Graphene TX Inc.	Materials	USA
KBioHealthcare	Health Services	Korea
LN Robotics	Device	Korea
Neuronity Therapeutics, Inc.	Biomedical	USA
Drop Wireless, Inc.	Information Technology	USA
Wis Medical	Biomedical	USA

SPC & IPC Judges:

Judge Name	Mentor Title
Huh, Charlie	Digital Entertainment Tech Startup Executive
Kim, Greg (Kwangrok)	Partner & Co-Founder, Primer Sazze
Kim, Se-Hwang	COO, ATTRAKT USA, Managing Partner at MVLASF
Kim, Dylan	Sr Engineering Manager, Connectivity System at Tesla
Son, Gina	Investment Associate, KDB Silicon Valley

In each category, the selected 10 finalists pitched to the panel of 5 judges. The winners are as below:

Idea Pitch Competition

- 3rd place winner for $500 cash prize: Kwell Health Care
- 3rd place winner for $500 cash prize: Snoov
- 2nd place winner for $1,000 cash prize: MetaForce
- KIC-DC 1st place winner for $3,000 cash prize: SH

Startup Pitch Competition

- 3rd place winner for $1,000 cash prize: Deep Anchor Solution
- 3rd place winner for $1,000 cash prize: Wis Medical
- 2nd place winner for $2,000 cash prize: Osteogen Bio
- SK Biopharmaceuticals 1st place winner for $10,000 cash prize: KBio Healthcare

Figure 6. IES 2023 SPC & IPC Award Ceremony

The cash award for the first-place winner of SPC was sponsored by SK Biopharmaceuticals, and the first-place winner of IPC was sponsored by Korea Innovation Center-DC (KIC-DC). The award ceremony for the winners was held during the UKC Closing Session on the competition day. Figure 3 is a photo taken during the ceremony.

6. IES Startup Demo Program

The Startup Demo program provided SPC and IPC invitees to demonstrate their technologies, products, and/or services to the UKC attendees for two days, August 3 and 4. The Demo also provided the networking opportunity with visitors (VCs, technologists, scientists, marketers, etc.).

Figure 7. IES 2023 Demo Session

7. IES Networking Events

The IES Committee prepared three networking events to provide the attendees and startup founders with opportunities to network with investors and potential partners in friendly atmosphere:

- **IES Networking Dinner**: This is the networking dinner prepared by UKC at 6:30 ~ 8:30 PM on Friday, August 4, 2023, where attendees networked with other participants having dinner. This networking event was ***sponsored by SK Biopharmaceuticals and KDB Silicon Valley***.
- **IES Networking Gathering**: Immediately after the networking dinner, IES participants continued their networking over drinks for about three hours (9:00 ~ 12:00 PM) at the Presidential Suite This networking event was ***sponsored by Korea Investment Corporation***.
- **SPC Networking Lunch**: Immediately following the UKC Closing Session was a networking lunch where the finalists and semifinalists enjoyed networking with the judges and seasoned technologists and scientists of KSEA. The event was ***sponsored by PRIMER SAZZE***.

Figure 8. IES 2023 Networking Sessions

8. Sponsors and Supporters

IES 2023 would have been possible without generous sponsorship and supports. KSEA truly appreciate all sponsors and supporters listed below.

SPC Award Sponsor

SK biopharmaceuticals

IPC Award Sponsor

KIC
Korea Innovation Center
Washington DC

IES Networking Dinner Sponsor

SK biopharmaceuticals

KDB Silicon Valley
Venture Capital

SPC Networking Lunch Sponsor

PRIMER SAZZE

IES Sponsors

KIC 한국투자공사
Korea Investment Corporation

B.J. KANG LAW, PC
ATTORNEYS AT LAW

IES Supporters

KITEE
Innovation to Business

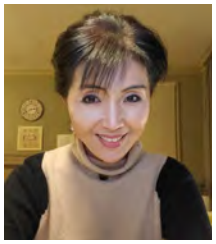
Small Medium Enterprise Committee

SEED Report

SEED Report

Organizing Committee

Director



Sua Myong

Professor
Harvard Medical School

Hae-Bun Andrew Yun

Associate Professor
University of Central Florida

Yumi Kim

Assistant Professor
Johns Hopkins Univeristy

Juhun Lee

Assistant Professor
University of Pittsburgh

Seungil Kim

Assistant Professor
University of Pittsburgh

SEED 2023 was held at the Hyatt Regency DFW, Dallas, Texas on August 1-2, 2023. This workshop supported by KSEA since 2013, has provided mentorship to, and help develop the careers of, junior Korean-American scientists and engineers. I am honored and privileged to be given an opportunity to organize this important workshop as a SEED director with a phenomenal group of committee members, including Prof. Hae-bum Yun (University of Central Florida), Prof. Yumi Kim (Johns Hopkins University), Prof. Juhun Lee (University of Pittsburgh) and Prof. Seungil Kim (University of Pittsburgh).

Under the theme of "*Leading and Thriving in Academia,*" this year's program aimed to provide opportunities for participants to discuss career planning and development, leadership development, sustainability, and cultivate mentoring relationships. We are pleased to have more than 80 selected participants, including PhD students, postdoctoral scholars, and early-career professionals in attendance. This year's program included three plenary sessions, four panel discussion sessions with 11 mentors, and a poster session followed by a teatime with ~19 sponsoring institutes. Three plenary sessions were delivered by leading scientists who shared their wisdom on building an exciting and successful career and life. Multiple panels on seeking academic and industry positions, job interview processes, and negotiations provided opportunities for participants to ask questions and interact with mentors and speakers. Small groups of eight per round table were also designed to foster informal, direct conversations between mentees and mentors regarding career development, research, and any other topics of interest. We implemented a poster session aiming to explore active communication amongst participants, fostering conversations with the sponsors and receiving feedback from mentors and speakers. We had a truly blessed meeting where both mentors and mentees were inspired, refreshed, and strengthened. As evidenced by many testimonials (see below), many participants expressed deep appreciation and gratitude.

SEED 2023 Schedule

Day 1, August 1, 2023 (Tues)				
11:30 - 1:00 PM	**Registration**			**Aviator (A-B)**
12:00 - 1:00 PM	**Lunch**			
1:00 - 1:10 PM	**Opening Remarks and Introduction**		**Sua Myong** SEED 2023 Director	**Innovation Room (A-D)**
1:10 - 1:20 PM	**Welcome Address**		**Yongho Sohn** KSEA president	
1:20 - 2:20 PM	Session 1	**Plenary Talk I**	**Young-Kee Kim** Professor, University of Chicago	
2:20 - 3:20 PM	Session 2	**Panel Discussion: Leadership development**	**Young-Kee Kim** Professor, University of Chicago **Jaeung Jung** Professor, Cleveland Clinic **Kwang-Soo Kim** Professor, Harvard University **Harold Kim** Associate Professor, Georgia Tech	
3:20 - 4:00 PM	**Coffee Break**			
4:00 - 5:00 PM	Session 3	**Plenary Talk**	**Jaeung Jung** Professor, Cleveland Clinic	**Innovation Room (A-D)**
5:00 - 6:00 PM	Session 4	**Panel Discussion: Seeking professional jobs**	**Dong-hyun Kim** Associate Professor, Northwestern University **Kate Hyun** Associate Professor, University of Texas at Arlington **Joon-Seok Kim** R&D Scientist, Oak Ridge National Laboratory **Hyun-Eui Kim** Assistant Professor, UTHealth Houston **Eunhee Kim** Assistant Professor, University of Texas at Houston **Myoungkyu (M.K.) Lee** Assistant Professor, University of Alabama	
6:00 - 6:30 PM	**Break (Group Photo)**			
6:30 - 8:00 PM	**Dinner**			**Aviator (A-B)**
8:00 - 9:00 PM	Session 5	**Ice Breaker Game Kahoot**	SEED Committees	**Innovation Room (A-D)**
9:00 - 10:00 PM	**Networking**			

Day 2, August 2, 2023 (Wed)				
8:00-9:00AM	**Breakfast**			**Aviator (A-B)**
9:00-10:00AM	Session 1	**Plenary Talk**	**Kwang-Soo Kim** Professor, Harvard University	**Innovation Room (A-D)**
10:00-10:15AM	**Break (Poster Setup)**			
10:15-12:00PM	Session 2-1	**Panel Discussion: Academic job search/ interview in USA**	**Navigating the Academic Job Market: Strategies and Tips for Success in the USA** **Yoon-A Kang** Assistant Professor, Washington University in St. Louis **JuHyun Lee** Assistant Professor, University Texas at Arlington **Joon-Seok Kim** R&D Scientist, Oak Ridge National Laboratory **Eunhee Kim** Assistant Professor, UTHealth Houston **Hyun-Eui Kim** Assistant Professor, University of Texas Health Science	**Fort Worth**
10:00-12:00PM	Session 2-2	**Panel Discussion: Research (funding)**	**Lab Mastery: Unlocking the Secrets to Effective Management and Success** **Harold Kim** Associate Professor, Georgia Tech **Sunghoon Kang** Associate Professor, Johns Hopkins University **Chi Hwan Lee** Associate Professor, Purdue University **Dong-hyun Kim** Associate Professor, Northwestern University **Kate Hyun** Associate Professor, University of Texas at Arlington	**Grapevine**
12:00-1:00PM	**Lunch**			**Aviator (A-B)**
1:00-3:00PM	**Poster session** with research institute presidents, university presidents and corporate executives from the US and Korea			**Innovation Room (A-D)**
3:00-4:30PM	**Teatime** with research institute presidents, university presidents and corporate executives from the US and Korea			
4:30-5:00PM	**Closing and Poster Award**			

Graduate Student Helpers

Sunghyun Cho

Graduate Student
Johns Hopkins
University

Jimin Kang

Graduate Student
Johns Hopkins
University

Two graduates students, Sunghyun Cho (left) and Jimin Kang (right) were recruited to assist the committee at the SEED 2023 meeting. They provided critical help of setting up the meeting rooms with A/V, checking in all the participants at the registration desk, taking photographs all throughout the meeting, assisting committee members in various aspects and taking care of the sponsors' need. We are truly grateful for their service.

Plenary Talks

SEED 2023 featured three plenary talks given by three distinguished scholars including Dr. Young-Kee Kim (University of Chicago), Dr. Jae Jung (Cleveland Clinic), Dr. Kwang Soo Kim (Harvard Medical School).

The first plenary talk was delivered by Dr. Young-Kee Kim who shared about her life journey of becoming a high energy physicist which started with a spark of interest in math and physics at a young age. As a fifth child among her siblings, she was given the freedom of pursuing her desire in all aspects of her life. She expressed her deep gratitude toward several key mentors who encouraged her to climb higher mountains in her career trajectory. Dr. Kim unfolded a discussion on a rather sensitive topic of "*bamboo ceiling*" i.e limitations, discrimination and disadvantages that we face as Asian Americans living in the US, especially in an academic world. She challenged us to have confidence, pursue excellence and be courageous!

Our second plenary talk was given by Dr. Jae Jung who delivered a powerful story of his scientific life as a "*mission*" that keeps driving him even today. He faithfully followed his calling to be a leader who expands and improves his department and school. For example, his relocation from Harvard Medical School to USC resulted in increasing the ranking of his department from over 20 to top 5 within his ~10 years at USC. Dr. Jung has a remarkable track record of holding approximately ten NIH R01 grants continuously to study various infectious viruses that pose a constant threat to public health. "*Infinity and beyond!*" is the mindset that Dr. Jung left with us.

Dr. Young-Kee Kim

Dr. Jae Jung

Dr. Kwang Soo Kim

The third plenary talk was given by Dr. Kwang Soo Kim who humbly shared with us incredibly difficult setbacks, failures and disappointments that blocked his career path left and right. Nevertheless, he persisted and endured through them to become the successful, innovative, and curiosity-driven scientist that he is today. Each time he faced hardships, there was a special person, circumstance or gift which enabled him to go one extra mile and such miracles empowered him to continue the journey as a scholar and a researcher. His recent discovery led his research team to come up with a dopaminergic cell-based cure for Parkinson's disease. Unlike other approaches, his research-based therapy is producing highly promising treatment potential. We all cheer for Dr. Kim's new therapy to save many patients who suffer from incurable neurodegenerative diseases! Overall, the plenary talks were highly impactful, inspirational, energetic, and moving. We were all touched by the sincerity and humility of all three speakers.

Panel Discussion

Four panel discussion sessions were facilitated during the SEED 2023 Workshop. The mentors are the leaders or rising stars in their fields, which included Dr. Young-Kee Kim (University of Chicago), Dr. Jaeung Jung (Cleveland Clinic), Dr. Kwang-soo Kim (Harvard University), Dr. Harold Kim (Georgia Tech), Dr. Dong-Hyun Kim (Northwestern University), Dr. Kate Hyun (University of Texas at Arlington), Dr. Joon-Seok Kim (Oak Ridge National Laboratory), Dr. Hyun-Eui Kim (UTHealth Houston), Dr. Eunhee Kim (University of Texas at Houston), Dr. Myoungkyu (University of Alabama), Dr. Yoon-A Kang (Washington University in St. Louis), Dr. Juhyun Lee (University of Texas at Arlington), Dr. Sunghoon Kang (Johns Hopkins University), and Chi Hwan Lee (Purdue University).

Two panels were held on the first day in the afternoon and the two breakout panels were held on the second day morning. Each panel session first started with a brief introduction of the panel members; discussed the questions that are pre-collected via participant surveys; and ended up with an open discussion. Four panel discussion sessions discussed different topics that include Leadership development, Seeking professional jobs, Navigating the Academic

Job Market: Strategies and Tips for Success in the USA, and Lab Mastery: Unlocking the Secrets to Effective Management and Success.




Dinner Banquet and Presentation by Dr. Tae-Sik Lee (KOFTS President)

The evening event of the first day started with congratulatory remark by Dr. Tae-Sik Lee, the President of KOFST. Dinner banquet was followed by social networking session. Delegates from 12 sponsoring institutes joined the banquet and social networking.


Institute	Name
한국과총 (KOFST)	이태식 회장, 엄정욱 부장, 김지연 선임행정원, 박정인 행정원
한양대학교	조성문 서울 교무처장, 신성원 ERICA 교무처장
금호석유화학 (KPPC)	고영훈 소장, 황진만 부장
한화솔루션	김재형 소장
경북대학교	홍원화 총장, 최열 국제협력처장
한국화학연구원 (KRICA)	최영민 부원장
한국산업기술평가관리원	서용원 부원장
건설기술연구원 (KICT)	김현준 부원장, 류승기 본부장
SK Innovation	함진수 매니저
인하대학교	김주형 연구처장
태재대학교	염재호 총장
광주과학기술원 (GIST)	김재관 대외협력처장

Kahoot and networking session

After the dinner, all SEED participants, including mentors and sponsors, engaged in an icebreaking team collaborative game called Kahoot. Following 40 minutes of friendly and lively games, all participants transitioned to the networking session to further their discussions with mentors, peers, and sponsors.

Poster Session and Poster Awards

On the second day, we held a poster session, during which 45 participants from diverse backgrounds and ranks showcased their work. All SEED participants and sponsors were present at the poster session, and the Nobel Laureate, Dr. Barry Barish, made a special appearance. The poster session sparked lively discussion among the attendees and provided excellent opportunities to connect with the sponsors and network with the other attendees. The list of poster presenters is shown below:

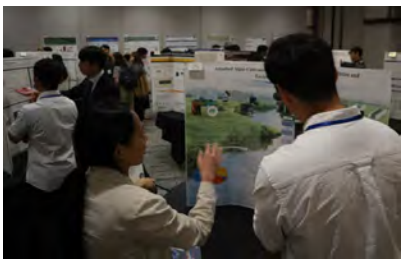
Name	Affiliation	Current Position	Poster Title
Jongyeop Kim	Georgia Southern University	Junior Faculty	Enhanced Deep Learning Model for Structural Damage Identification via Random Vibration
Youngsup Song	Lawrence Berkeley National Laboratory	Postdoc	Understanding and enhancing pool boiling heat transfer via surface property and structure design
Dong Hyuk Kim	University of Georgia	Postdoc	Development of on-site quality management system for asphalt pavement using IoT
Suryeon Kim	Texas A&M University	Graduate student	Virtual Lean Simulation Games for the Construction Industry and their Potential to Enhance Learner Competencies
Da Yun Kwon	University of Idaho	Graduate student	Development of Early Warning System for Harmful Algal Bloom Using Hyperspectral Imaging System
John Sunwoo	Massachusetts General Hospital	Postdoc	Analysis of cerebral perfusion-utilization (CPU) in extremely premature infants with brain injury
Hyo-Jung Jeong	Marquette University	Postdoc	Variability of lower extremity joint coodination during walking in children with joint hypermobility
Dongheon Lee	Duke University	Postdoc	Single-cell Analysis of Gene Expression Modulation through Phase Separation
Seung Hwan Lee	MIT	Postdoc	Synthetic, orthogonal metabolic pathways for sustainable bioconversion and manufacturing of industrially relevant chemicals
Jayoung Kim	University of North Texas Health Science Center	Junior Faculty	Enabling strategies for precision cancer gene theraypy
Dennis Lee	Johns Hopkins University	Postdoc	Solvent-free synthesis and modification of membranes for industrially relevant gas separations
Elijah Lee	University of Pennsylvania	Graduate student	Vision-based preimemter defense via multiview pose estimation
Suehyun Park	Massachusetts Institute of Technology	Graduate student	Comprehensive view on electrical double layer for concentrated aqueous and organic electrolytes

Mingi Jeong	Dartmouth College	Graduate student	Towards Robust Autonomous Navigation System by Robotic Boat under High-traffic Environments
Jeonghoon Lim	Lawrence Berkeley National Lab	Postdoc	Electrochemical nitrate and nitrite treatment with rational catalyst design
Sunghee Estelle Park	University of Pennsylvania	Graduate student	An Alveologenesis-on-a-Chip for Studying Human Lung Development
			Geometric engineering of organoid culture for enhanced organogenesis in a dish
Kyunghoon Kim	University of Washington	Graduate student	Improving the assessment of blood compatible biomaterials for intrinsic pathway
Jimin Kang	Johns Hopkins University	Graduate student	Engineered helicase replaces thermocycler in DNA amplification
Woi Sok OH	Princeton University	Postdoc	Spatio-temporal emergent patterns of internal forced migration flows in Somalia
Sungwoook Jung	Harvard Medical School	Postdoc	Epitopic high endothelial venule-targeted nanodelivery for type 1 diabetes
Sangyeon Cho	Massachusetts General Hospital/Harvard Medical School	Postdoc	Nanolasers for next generation optical probes
Taeyoon Jung	University of Washington	Graduate student	Structural and biochemical characterization of the thiol-methyltranseferases 1A and 1B
Nakian Kim	University of Illinois, Urbana-Champaign	Postdoc	Characterization of spatial variability of in-season and N2O fluxes from typical mid-western agriculture
Sungwhan Kim	Sandia National Laboratories	Postdoc	Attached algae cultivation for sustainable bioenergy production and environment remediation
Sooyeon Lim	Seoul National University	Graduate student	Analysis of the relationship between innovation activities and profitability in banking industry in Korea
Inah Gu	University of Arkansas	Graduate student	Effects of berry volatile extracts on LPS-induced intestinal inflammation in a caco-2/RAW264.7 co-culture model
Taeksoo Kim	Texas A&M University	Graduate student	Intelligent compressed air storage system in manufacturing facilities with intermittent demand
Bo Mi Lee	University of Central Florida	Postdoc	Engineered multifunctional and stimuli-responsive nanocomposites
Hodam Kim	Georgia Institute of Technology	Postdoc	Wireless real-time detection of sleep quality and disorders via an all-in-one membrane patch

Hojoong Kim	Georgia Institute of Technology	Postdoc	Outdoor-reliable continuous stress monitoring with a nanofabric radiative cooler on wireless soft bioelectronics
Byunghang Ha	Stanford University	Postdoc	Mechanical engineering of immune cell trafficking
Sunghyun Cho	Johns Hopkins University	Graduate student	Co-transcriptional folding of nascent RNA in presence of RNA binding proteins
Sungha Hong	University of Texas Health Science Center at Houston	Postdoc	Early restoration of global hypoperfusion by pharmacological TRPV1 activation after SAH
Hyun-Woo Lee	University of Utah	Postdoc	Medial entorhinal cortex has a specialized role in flexible, context-dependent timing
June Ho Hwang	UT Southwestern	Graduate student	Investigating viscoelasticity of biomolecular condensates using microrheology
Hwanwoo Kim	University of Chicago	Graduate student	"*Plus/mius the learning rate*": easy and scalable statistical interference with SGD
Junho Park	Texas A&M University	Graduate student	Assessing workload in using electromyography (EMG)-based prostheses
JuHyeong Ryu	West Virginia University	Junior Faculty	Assessment Methods for Advanced Trade Work Systems
Jeong-Hwa Kim	North Dakota State University	Postdoc	Autonomous stand counting in field pea using aerial imagery
Saeyeong Jeon	University of Florida	Graduate student	From PhD to Entrepreneurship: unleashing innovations
Mijin Kwon	Dartmouth College	Graduate student	What can "*brain signature*" tell us about pain and rewards?
Sunghyun Hwang	University of Florida	Graduate student	Atmospheric HF dry mode based silicon etching with Pt catalyst for high aspect ratio silicon nanowire arrays
Hyeonseok Kim	Georgia Institute of Technology	Postdoc	Wireless sleep monitoring biopatch for at-home sleep quality and sleep apnea assessment
Woolim Hong	North Carolina State University	Postdoc	Towards Personalied Control for Robotic Knee Prostjeses

The posters were evaluated by 14 poster judges consisting of SEED mentors and committee members (Drs. Sua Myong, Yumi Kim, Juhun Lee, Seungil Kim, Haebum Yun, Joon-Seok Kim, Harold Kim, Dong-Hyun Kim, Yoon-A Kang, JuHyun Lee, Sunghoon Kang, Hyun-Eui Kim, and Chi Hwan Lee). Scores ranging from 1 to 5 were assigned based on the provided background and hypothesis, the clarity of materials and methods explanation, impact on the field, and presentation style. Each poster was evaluated by two judges, and awards were given to the top five participants with the highest scores, as indicated below. The poster awards were generously provided by UKC president Dr. Yongho Sohn and were presented during the closing ceremony.

Awards	Awardees
Best Presentation Award (1st place) - MacBook Air	Sungha Hong
Best Presentation Award (2nd place) - iPad	Sunghee Estelle Park
Best Presentation Award (3rd place) - AirPod	John Sunwoo
	Jimin Kang
	JuHyeong Ryu


Photos from the poster session and award ceremony

Teatime

After the poster session, we organized a teatime event with delegates from sponsoring institutes, which provided a unique opportunity for networking.

기관	참석자
한국과총 (KOFST)	이태식 회장, 엄정욱 부장, 김지연 선임행정원, 박정인 행정원
한양대학교	이기정 총장, 조성문 서울 교무처장, 신성원 ERICA 교무처장, 변중무 산학협력단장, 신새라 과장, 현지숙 주임
GS Caltex	임종구 기반기술팀장, 이경준 연구기획팀 책임연구원, 강기훈 연구기획팀 선임연구원
아주대학교	최기주 총장, 안병민 연구정보처장, 강신구 국제협력처장
금호석유화학 (KPPC)	고영훈 소장
한화솔루션	김재형 소장
경북대학교	홍원화 총장, 최열 국제협력처장
한국화학연구원 (KRICA)	최영민 부원장, 이권희 실장, 박은미 선임, 김준현 선임, 정래익 행정원
한국산업기술평가관리원	서용원 부원장
서울대학교	김재영 연구부총장, 이재진 원장, 황준석 센터장
건설기술연구원 (KICT)	김현준 부원장, 류승기 본부장, 김강석 (Head), 이동섭 (Research Fellow), 김형준 (Senior Researcher), 박재홍 (Senior Researcher)
SK Innovation	함진수 매니저
인하대학교	김주형 연구처장
태재대학교	염재호 총장
광주과학기술원 (GIST)	박래길 교무부총장




Photos from Teatime

Concluding Remarks

I am truly grateful for the privilege to serve as the director of the 2023 SEED meeting. The 2023 workshop brought together a special group of students, postdoctoral fellows and faculty members who willingly shared their precious time with each other. I want to express my deep gratitude to the three plenary speakers who poured out their life stories of failures, hurdles and difficulties that led them to who they are today. I also want to thank all the mentors who spoke at the panel meetings with passion and genuine heart. All the participants were greatly touched, encouraged, and strengthened! The success of this workshop was enabled by the SEED committee members and the two graduate student helpers who tirelessly served all the needs that arose before and during the meeting. We formed a tightly knit team! My special thanks to KSEA president Dr. Yongho Sohn, especially for his generous gift of Mac book air, ipad and air pods that were awarded to the five poster winners. The KSEA head quarter staff including Dr. Soyoon Kum, Euna Yoon, Joseph Kim and Katie Park provided timely help all throughout the preparation and during the meeting. I sincerely hope that the memories of the SEED 2023 will be cherished by everyone, and the information shared, and the opportunity provided for networking during the workshop will help participants further their career.

Testimonials of participants

Hyunwoo Lee
University of Utah

저는 이번 SEED 참석이 처음이었는데, 행사를 기획하고 준비해주신 여러 교수님들 덕분에 너무 유익하고 즐거운 시간 보낼 수 있어서 좋았습니다. 정말 기대 이상이었고, 기회만 된다면 다음번엔 SEED는 물론이고 UKC도 같이 참석하고 싶다는 생각이 들었습니다. 지금 포닥 2년차를 보내고 있는데, 이 시기에 정말 실용적이고 유용한 조언들을 많이 얻었고, 비슷한 분야의 포닥분을 룸메이트로 만나게 되어 비슷한 고민을 나누고 공감 할 수 있어 좋았습니다."

Daeun Noh
University of Texas at Austin

저는 SEED-UKC에서 참석했던 노다은이라고 합니다. 우선 career 에 있어서 고민이 많은 저에게 SEED 참석은 여러모로 도움이 많이 되는 뜻깊은 일이었습니다. 좋은 분들을 직접 만나고 얘기할 수 있는게 제가 다시금 제 길을 생각하는데 있어서 많은 도움이 되었습니다. 같은 여성 과학자로서, 또 선배님으로서 교수님께서 나눠주신 경험들이랑 말씀들이 많은 힘이 되고 공감이 되었습니다. 감사합니다."

Byunghang Ha
Stanford University

I am Byunghang Ha, a postdoctoral fellow at Stanford University. The SEED proved to be an invaluable experience for me as a postdoctoral fellow preparing to enter the faculty job market. The networking opportunities were exceptional, connecting me with established scholars, fellow postdocs, and enthusiastic graduate students in the Korean-American academic community. The honest and devoted experience-sharing and interactions enriched my perspective on how to thrive as a non-native 1st-gen Korean as an academic professional in the USA. I highly recommend this workshop to fellow postdocs seeking to enhance their journey towards a successful faculty career. The conference helped me make important decisions around when to go out for family job market and which grants I should target and try. In addition, helped significantly get to know Korean-American researchers throughout the USA.

Hyo Jung Jeong
Marquette University

All speakers and participants inspired me and encouraged me to continuously pursue my career.

Daeun Noh
University of Texas at Austin

The SEED workshop was a great opportunity to reflect myself before starting my new journey as a post-doc. I had great inspirations through the senior speakers and meeting those who were a bit ahead guided not only my career path but also values on my lifestyle. The precious keyword I received was being a 'good citizen' is sometimes enough. I would strongly recommend for those who are in their early career to participate!

Kyusik Kim
Tessera Therapeutics

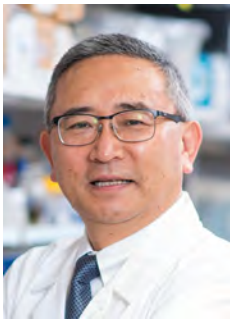
Although I am working in industry area, it was invaluable time for me to learn how to grow and what I will consider for the future career from presentations and conversations with senior professionals and people from different fields, since there are many common aspects for professional developments between academia and industry. I also had conversations with senior professionals who had industry experience. It was great to learn that it is quite open for transition between the two different area in career development.

Hyun-Eul Kim
McGovern Medical School

It was a great pleasure to meet and catch up with my old friends. The talks were quite inspirational, and meeting new people was great. I fully enjoyed the meeting and came back with full energy to continue my research. I hope I was helpful to the students and postdocs. Thank you again for inviting me, and I look forward to seeing everyone in the future when our paths cross again.

Kwang-Soo Kim
Harvard Medical School

이번에 시드 심포지움에 초청해 주셔서 많은 젊은 후배 과학자들과 만나서 귀한 교제와 만남을 가질 수 있게 해 주신 것을 깊이 감사드립니다! 저의 부족한 경험이 젊은 과학자들에게 조금이라도 선한 영향력을 미칠 수 있기를 기도하면서 강의를 준비했습니다. 그런데 여러 가지 경로를 통해서 좋은 피드백을 받고 또 좋게 평가해 주셔서 감사드리고 모든 영광을 주님께 올려 드립니다!



Jae Ung Jung
Cleveland Clinic

Thank you for inviting me to this outstanding and exciting SEED meeting. I truly had a wonderful time with many enthusiastic young people! Especially at this age, talking to young people would be a blessing. If I can be of further assistance, I will be there.

FIRE (Fostering Innovation in Rising Experts) Symposium Report

FIRE Symposium

FIRE is a symposium at UKC comprised of 100 young professionals, graduate/undergraduate students, postdocs, and junior faculty. FIRE gathers the next generation of leaders in industry and academia from North America for knowledge dissemination via two main pathways.

FIRE
Fostering Innovation in Rising Experts
Symposium

UKC FIRE 2023

1. Sharing professional development lessons learned (non-technical) such as:
   - Getting promoted/a raise
   - Acing interviews/Building strong resumes
   - Enhancing productivity with AI tools
   - Transitioning fields & unique career paths
   - Choosing between industry and academia
   - Becoming an empowering leader
   - Navigating the U.S. as a Korean/-American
   - Overcoming impostor syndrome
   - Personal Branding & Self-Advocacy

2. Networking within and outside their fields of interest to encourage broad awareness of cutting edge science and engineering fields, interdisciplinary collaborations, and skills cultivation applicable across careers in industry, academia, and government.

Organizing Committee

Chair

TJ Park

PhD Candidate
MIT

Vice-Chair

James Han

Postdoctoral Scientist
Harvard

Vice-Chair

DK Kim

Project Lead
Data Analytics
Zurich

Programs & Networking

Amy Jang

Pediatric Pharmacist
Boston Children's

Programs & Networking

Kate Kyuri Kim

MSc Candidate
University Toronto

Seunghwan Allen Lee

Postdoctoral Associate
MIT

Logistics & Communications

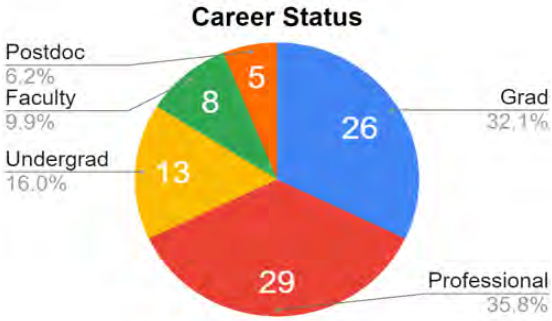
Andy Kim

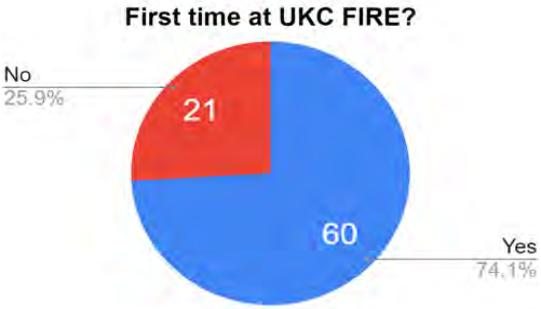
Medical Scribe
Kaiser Permanente

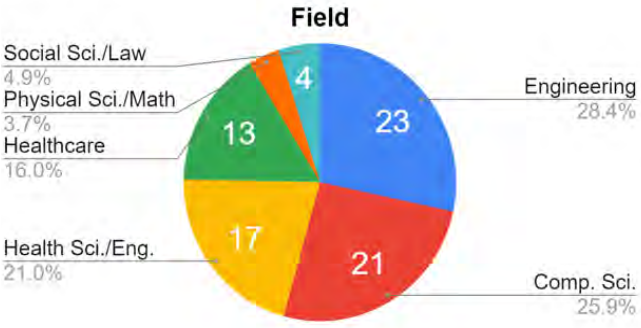
Tommy Cho

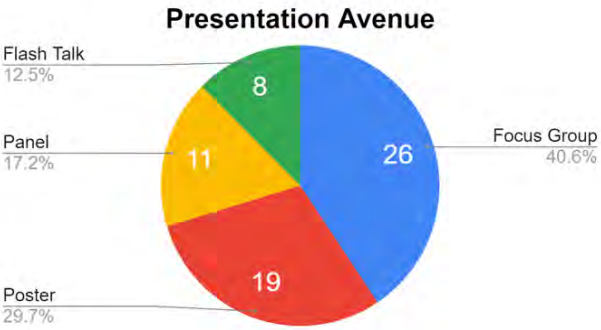
BS Candidate
Rutgers University

Participant Statistics

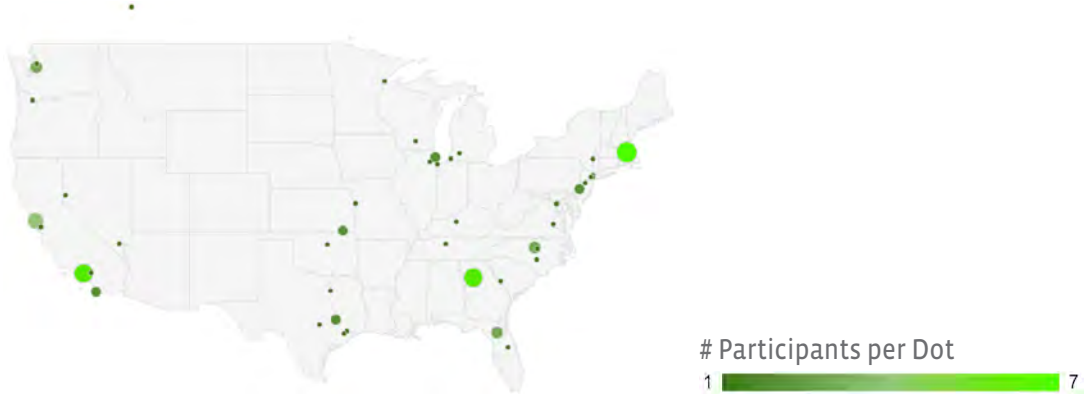








Geographic Distribution



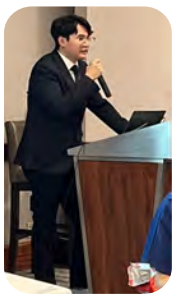
Welcoming Remarks & Introductory Networking (Icebreaker)

Thursday, 4:00 – 5:00pm | @ Innovation Ballroom C&D

Coordinators: TJ Park, James Han, DK Kim, Kate Kim

Organizers explained: What is KSEA? What is UKC? What is FIRE Symposium? Organizers then gave an overview of the program, what to expect over the next several days, and answer any questions.

Directly thereafter, FIRE started icebreakers where participants will be grouped in roundtables according to their professional skills development needs and career goals indicated in their FIRE applications. Participants were encouraged to freely connect and get started on networking with new mentors, mentees, peers, and friends at FIRE.



Career Flash Talk

Thursday 5:00 – 6:00pm | @ Innovation Ballroom C&D

Coordinator: Amy Jang

This presentation avenue, themed "*Next Step to Professional Growth*," featured 5-minute talks with slides about a wide variety of topics, spanning industry and academic career development, unique career paths, challenges in tech, STEM gender equity, skills cultivation, and overcoming personal challenges. The presentations were meant to inspire the audience and help advance their careers. The target audience was the entirety of FIRE Symposium, collected in one room to learn together and encouraged to actively participate in Q&A after each presentation.


Chanwook Park

PhD Candidate
Northwestern University

Importance of Acquiring and Being Aware of Intellectual Properties in academic research

As a PhD candidate in Mechanical Engineering, I am attending an internship at the Innovation and New Ventures Office (INVO) at Northwestern University, in short, the patent and technology transfer office. During the FIRE presentation, I would like to share lessons that I learned during the tech transfer internship, focusing on the importance of acquiring and being aware of intellectual properties in academic research.

Career Flash Talk (Continued)

Thursday 4:45 – 6:00pm | @ Innovation Ballroom

Jihye Jeon

PhD Candidate
Princeton University

A Nuclear Engineer who Dreams the World Peace

It is very important to have a capability to interact and communicate with a diverse spectrum of people to tackle a big issue like nuclear weapons. From my experience, I see this goal of world peace will not be achieved overnight but I believe dreamers like me will slowly change the world.

Inhwa Son

MS Candidate
University of San Francisco

My journey as a female engineer

Through my experiences as a female engineer, I have realized the significance of fostering diversity and empowering women in tech. Attending conferences and participating in events allowed me to connect with accomplished female tech leaders, gain valuable insights, and reinforce the importance of mentorship and community support. Additionally, engaging in collaborative initiatives and leveraging my expertise in cybersecurity showcased my ability to make meaningful contributions and build upon a foundation of excellence.

Inyoung Cheong

PhD Candidate
University of Washington

Thriving through Rejections

Given my interdisciplinary research area and unique background, coming from both an art background and a government job, I faced numerous rejections. Dealing with frustrations, I discovered that common advice like embracing rejections as opportunities for growth didn't resonate. Instead, I developed my own approach, relying on three powerful phrases that have helped me regain my composure even during my lowest moments.

Hyoungjin (Harry) Park

BS Candidate
USC

"*Gap*" Year: Learning to Prioritize Yourself

We should aim to work on building ourselves, not just our careers.

Jenny Namkoong

Interventional Cardiology Fellow
Univ. of Manitoba

Shamelessness – My Superpower

Shamelessness – living without fear of other humans – gives me strength to reach heights that I cannot reach when held back by the fear of what other people might think. Shamelessness is not "*not feeling nor caring about others' perceptions*", but rather despite being sensitive to feeling it, being able to let that sensitivity go quickly and recalibrate to the standard that I deem truly worth basing my self-value upon.

Veronica JungYeon Kim

Software Engineer
Weights & Biases

Maximizing your time outside of work

Engaging in activities outside of work contributes to both personal and professional growth. It is advisable to make use of your free time to explore a wide range of activities available to find the ones you enjoy the most, and continue pursuing them.

Panel Discussion: Perspectives on Academic Careers

Friday 4:00 – 5:00pm | @ Innovation Ballroom A

In this panel discussion, each speaker gave a 5-minute informational talk on topics ranging from defining success as a researcher, how to succeed in the academic job market, how to transition from research to teaching, and techniques to improve teaching. Then, the moderator, panelist, and audience engaged in an open dialogue on broader topics such as the reason for choosing an academic career path. The panel was meant to enlighten students, postdocs, and industry professionals alike on research oriented trajectories.

Seunghwan Allen Lee

Postdoctoral Associate
MIT

Moderator Biography

Allen leverages engineering biology to convert wastes into products, closing the carbon loop from chemical and fuel production. He specializes in engineering one-carbon (C1) metabolism for efficient utilization of C1 feedstock in biomanufacturing. During his undergrad at UCLA under Prof. James Liao, he worked on the implementation of heterologous methanol assimilation pathway (RuMP cycle) in E. coli. During his PhD at Rice U. under Prof. Ramon Gonzalez, he helped to develop synthetic, orthogonal C1 utilization pathways, Formyl-CoA elongation (FORCE) pathways, which enable a carbon and energy-efficient conversion of C1 compounds to various value-added small molecules.

As a postdoc in the Stephanopoulos Lab at MIT, Allen continues to engage in accomplishing sustainable biomanufacturing not only in utilization of sustainable feedstock but also in engineering efficient bioenergy production to "*upgrade*" low-energy feedstock to high-energy products. He is also looking into expanding the host engineering experience from a model bacterium (E. coli) to yeast (Y. lipolytica) and non-model bacteria (acetogens).

Jongbok Lee

Assistant Professor
University of Calgary

4:00 // How do you define a successful researcher?

The outcome of your efforts may come in a way that you do not expect. Follow your passion and be open to new and unique opportunities.

Biography

Dr. Jongbok Lee started his position as an assistant professor at the University of Calgary, Cumming School of Medicine, in July 2023. He is an expert in using donor-derived T cells, particularly double negative T cells (DNTs), as cancer immune therapy. He has conducted pioneering research into the therapeutic advantages and biology of DNT cells and promoted the clinical translation of DNT cell therapy to cancer patients. During his doctoral studies at the University of Toronto, he demonstrated that donor DNTs could target Acute Myeloid Leukemia (AML) cells without harming the normal cells and studied the underlying mechanisms. As a post-doctoral researcher at University Health Network, he led a clinical trial that assessed the feasibility, safety, and potential efficacy of allogeneic DNT therapy in AML patients and demonstrated the potential of using DNT as an off-the-shelf platform for Chimeric Antigen Receptor technology. Dr. Lee published his scientific discoveries as the first or co-first author in a number of high-profile scientific journals such as Science Immunology, Blood, Cancer Discovery, and Clinical Cancer Research, among others. His research led to two issued patents and four patent applications. He also founded "*DNT Therapeutics*" — a company currently commercializing and advancing clinical applications of DNT therapy. Dr. Lee has been named a Tier 2 Canada Research Chair in Cancer Immunology to recognize his achievements and potential for future research excellence.

Panel Discussion: Perspectives on Academic Careers (Continued)

Friday 4:00 – 5:00pm | @ Innovation Ballroom A

Soowon Chang

Assistant Professor
Purdue University

4:05 // Succeeding in the Academic Job Market

In this talk, I will share practical tips and strategies for navigating the competitive academic job market in engineering and technology, based on my personal experience. Attendees will learn how to strategically position themselves for success in the job market and increase their chances of landing a tenure-track assistant professor job.

Biography

Soowon Chang is an Assistant Professor of Construction Management Technology at Purdue U. She received her Ph. D in Building Construction from Georgia Tech. During her PhD, she worked on urban redevelopment projects in Tokyo for smart and connected communities supported by the National Institute for Environmental Studies, Japan. She received her B.S. in Architectural Engineering, B.A. in Management for Science and Technology, and M.S. in Architectural Engineering with emphasis on construction management from EWHA WOMANS UNIVERSITY, South Korea. Her research revolves around paradigm shifts in human-urban-building interactions with intelligent applications of disruptive technologies in the future smart cities for decarbonization, health and safety, and social equity. She conducts research about (1) smart and connected communities considering urban systems networks; (2) generative design and planning systems by optimizing functional, spatial, and temporal performance; and (3) energy infrastructure transitions through spatiotemporal data-driven analytics.

Bo Park

Assistant Professor
California State U., Fullerton

4:10 // Transitioning from research institution to teaching institution

Transitioning from a research institution to a teaching role presented challenges in developing my pedagogy and aligning research interests with teaching institution priorities. Balancing teaching and research commitments while adjusting expectations and seeking collaboration support became vital for success in both areas.

Biography

Dr. Bo Park received her doctorate in epidemiology and biostatistics from Drexel U., and her MPH from Dartmouth. She was a postdoc fellow in the Johns Hopkins Bloomberg School of Public Health, Department of Mental Health, and her research interests focus on unraveling the complex relationship between environmental exposures and health outcomes in vulnerable populations using epidemiologic methods. In Dr. Park's lab, Perinatal Environmental Exposure Awareness Study (PEEAS), undergraduate and graduate students are engaged in projects examining the role of environmental exposures on maternal and child outcomes.

Daewa Kim

Assistant Professor
University of Delaware

4:15 // How to Engage Students in Class: Improving Comprehension Through Practical Examples

One powerful strategy for achieving student engagement is the use of practical examples. By incorporating real-life scenarios and unexpected illustrations, educators can enhance students' understanding and make learning more enjoyable.

Biography

Dr. Daewa Kim is a junior faculty in the Department of Mathematical Sciences at the University of Delaware. Dr. Kim received her Ph.D. in Mathematics from the University of Houston. After graduation, she spent two years working as a postdoctoral research associate at West Virginia University and worked for one year at Duquesne University in Pittsburgh.

Dr. Kim has developed a passion for the mathematical modeling of real-world problems. Her recent focus has been utilizing a kinetic theory approach to crowd dynamics, aiming to suggest effective ways for various practical scenarios. It has successfully applied to a diverse range of areas, including the spread of infectious diseases, airport passenger flow, architecture, urban planning, and even criminal behavior.

Panel Discussion: Rewarding Careers in Healthcare and Lessons Learned

Friday 4:00 – 5:00pm | @ Innovation Ballroom B

In this panel discussion, each speaker gave a 5-minute informational talk on topics ranging from patient and self-care through COVID-19, holistic diagnoses and treatment, and unique career paths in dentistry and pharmacy. Then, the moderator, panelist, and audience engaged in an open dialogue on broader topics such as future outlook in the healthcare field. The panel was meant to enrich the audience on current issues in healthcare and provide first hand accounts of professionals applying available tools for patient care.

James Han

Postdoctoral Scientist
Harvard Univ.

Moderator Biography

James is a post-doctoral scientist specializing in aging research in Sharpe and Haigis labs at Harvard University, and a Banting fellow at the Canadian Institutes of Health Research (CIHR). His research involves understanding how our immune system deteriorates with aging and its implication in cancer and infectious disease. He completed his PhD in Ohashi's lab at the U. of Toronto, where he investigated novel strategies to improve T cell immunotherapy. He is an author of high-profile journals, recipient of 30+ academic/research awards, and numerous international lectureships. Beyond research, he is an elected council member of the American Association for Cancer Research (AACR) and held leadership positions in the field through his roles in CCIC, BioCanRx, and OICR. He also worked as a consultant for leading biotech/pharmaceutical companies evaluating the current landscape in immune-oncology and developing next-generation immunotherapy. James is passionate about supporting the Korean communities in N. America. He previously served as the founder and first-president of YG National and YG chapters/programs in Canada (in AKCSE & CKC), and previously held leadership positions in KSEA (Ygnite, IES, STEPUP and UKC-YG/PF).

Kevin Riutzel

Physician
Kheir Clinic

4:00 // Work Family

Biography

Born in South Korea and raised in the greater LA area, Kevin Riutzel is a family physician currently working in Los Angeles, CA. The clinic he works at is a federally-qualified health center in LA's Koreatown primarily serving local Korean-American and local AAPI communities, many of whom are the 1st generation in their families to immigrate to the U.S. He has served in several roles for the Asian Pacific American Medical Student Association including National President for three terms. He finished his undergraduate studies at UC San Diego and graduate studies at Columbia University. After graduating from Touro University Nevada, he completed his training in family medicine at UC Irvine with a focus on integrative medicine. He served as one of the chief residents while at UC Irvine. Kevin takes a particular interest in mental health in AAPI communities along with providing an integrative and holistic approach to the care he offers to the communities he serves.

Panel Discussion: Rewarding Careers in Healthcare and Lessons Learned (Continued)

Friday 4:00 – 5:00pm | @ Innovation Ballroom B

Jina Lim

Attending Physician, Massachusetts General Hospital Instructor in Medicine, Harvard Medical School

4:05 // Lessons During the Unprecedented COVID-19 Pandemic Applicable to Precedented Times

As a hospitalist during the COVID-19 pandemic, I was able to learn valuable professional development lessons including the importance of flexibility / adaptability, teamwork, continuous learning, and self-care. These challenges have provided opportunities for professional growth, making me a better physician and person.

Biography

Jina Lim is a hospitalist (an internal medicine doctor who specializes in the care of providing care to hospitalized patients) attending physician at Massachusetts General Hospital and an instructor to Harvard Medical School students and residents. She completed her undergraduate work at Cornell University (BA in Biological Sciences) and medical studies at the University of Washington (MD), and then underwent residency training at Tufts Medical Center in internal medicine. She is delighted to be part of the faculty at Massachusetts General Hospital and Harvard Medical School to provide excellent clinical care, research in quality improvement, supervise trainees, and embark on her career as a hospitalist at a historical and world-class institution.

Seung Jin Jang

DMD PhD Candidate University of Florida

4:10 // Dentist Scientist Training Program: full-ride dental school programs and career paths in dental academia

Overall, I believe that my choice of mentor, research project, and the training opportunities described in this essay will give me a solid foundation for my goal to follow the footsteps of my mentors and become the next generation clinician scientist in dental academia. Passing on wisdom through mentoring, and making an impact on the next generation of dentist scientists in dental academia is extremely important to me.

Biography

James Seung Jin Jang is currently the 7th year Doctor of Dental Medicine DMD-PhD candidate at the University of Florida College of Dentistry. Prior to joining the DMD-PhD program at UF, James worked in multiple laboratories at the National Institutes of Health. When James was at NIH, he regularly attended National Institute of Dental, Craniofacial Research rounds to observe both basic and clinical studies presented by dentist scientists. Interactions with these investigators strengthened his desire to pursue the academic career in dentistry. In summer 2017, James was accepted into the DMD-PhD program at the University of Florida College of Dentistry. While attending dental school, he worked in Dr. Toth's laboratory and was able to publish three abstracts and two papers as a co-first author and a co-author in virology journals. He also wrote a UFCD Student Seed Grant Application. The project the seed grant supported was the foundation for his current project and his NIH F30 application. In 2021, he was awarded UFCD High Research Honors Award and his NIH F30 application was selected for funding. In addition to dental education and dissertation research, he has been actively involved with the AADOCR National Student Research Group. Currently, while serving as the President of NSRG, he strengthens the network of dental students and dental academicians in the United States and Canada by organizing AADOCR/IADR conference sessions, networking events, workshops, research competitions and Zoom Q/A sessions. Through these activities, he aims to encourage dental students continue to pursue academic, research career paths.

Panel Discussion: Rewarding Careers in Healthcare and Lessons Learned (Continued)

Friday 4:00 – 5:00pm | @ Innovation Ballroom B

Clara Kim

Senior Manager in Medical Information Rare Tumors Astellas Pharma US

4:15 // Pharmaceutical Industry Career: Medical Affairs

Discuss alternative career paths for healthcare professionals in the pharmaceutical industry, specifically in medical affairs (medical education, strategy, insights) and learn the importance of self-awareness mentorship/networking to take the next steps in career transition.

Biography

Clara Kim, PharmD, is a Senior Manager, Medical Information at Astellas Pharma where she supports rare tumor products in AML and G/GEJ adenocarcinoma. In her role, Clara plays an important role to educate and provide accurate scientific information to patients, HCPs, and internal colleagues. Clara has had various roles within medical affairs in the pharmaceutical industry. Prior to her current role, Clara was an immunology Medical Science Liaison at AbbVie and a postdoc medical affairs fellow with Novartis Oncology, where she supported both US and Global Medical Information and MSL Strategy. She received her PharmD from the University of North Carolina Eshelman School of Pharmacy and her bachelors degree in neuroscience from Vanderbilt University.

Panel Discussion: Industry Careers and Interdisciplinary Opportunities

Friday 4:00 – 5:00pm | @ Innovation Ballroom C&D

Moderator: Jonathan Young Kim

In this panel discussion, each speaker gave a 5-minute informational talk on topics ranging from personal branding, navigating cultural differences, interviewing strategies, and unique career paths. Then, the moderator, panelist, and audience engaged in an open dialogue on broader topics such as different career trajectories in the technology sector. The panel was meant to enrich the audience on professional soft skills, emerging fields, and consider growth opportunities in their own careers.

Jonathan Young Kim

Lead Software Engineer Capital One

Biography

Two months after graduating with a B.S. from the University of Virginia, Jonathan "*Jonny*" Young Kim started working as a software developer for CSX, a railroad company. Jonny worked there for nearly 8 years. He kept things fresh while also climbing the career chain by looking for internal opportunities to switch teams and responsibilities. He also studied part-time towards an Online Master of Science in Analytics with Georgia Tech and graduated Summer 2022. As a hobby, Jonny likes finding and collecting action figures from various franchises such as Power Rangers and Pokémon. Eventually, he felt he needed more space for his collection and decided it would be nice if a company paid for the relocation... so he applied for a job opening at Capital One. It was the first time in his career that he changed companies. He is now a Lead Software Engineer doing full-stack development work for internal-facing web applications and currently looking for a perfect residence to house his toy collection.

John Lee

Associate Researcher
SEI

4:00 // Betting on yourself – making a change to a different industry or role

Do you daydream at work or school about a different life? Are you itching to grow, or get a bit more excitement in your professional life? We will discuss how to explore new opportunities, and how to use your personal strengths to create a satisfying career.

Biography

John has expertise in several areas of AI - Natural Language Processing, AI Platforms, AI Strategy, and AI Engineering. He is currently working as a Technology Architect at InQTel, sourcing and working with early stage startups to bring their capabilities into government agencies. At the Software Engineering Institute (SEI) at Carnegie Mellon University, he focused on the tools, practices and processes that enable the building of scalable, robust, secure, and human-centered AI. Prior to the SEI, he worked at KPMG, helping to build an AI practice, through the hiring of hundreds of AI professionals, and the delivery of hundreds of engagements to Fortune 100 companies. He led a global rollout of AI capabilities to 10+ countries, creating a platform for collaboration including approaches for IP sharing, licensing, and engineering standards. He has delivered AI across a number of areas, including financial regulations, sporting league operations, AI strategy, utilities, and has led AI due diligence as a part of private equity acquisitions. John received his MS and PhD from UCLA, and his bachelor's degree from the University of California at Berkeley.

Simon Park

Software Engineer
Uber

4:05 // Proactive Pathways: Navigating Success as a Korean American in the American Workplace

This experience has taught me the importance of assertiveness and proactive behavior for success. I learned to be more vocal about my interests, actively seek opportunities, and shed the notion of waiting for recognition alone.

Biography

Simon's academic journey began at St. John's U., where he initially pursued a degree in psychology, driven by his interest in non-profit work. However, after graduating, he discovered the emerging world of coding bootcamps and saw an exciting opportunity to join innovative companies and create remarkable things. Enrolling in a bootcamp, Simon launched his fulfilling career in software engineering. His journey since then has brought him to build applications for renowned brands like Shake Shack, ultimately leading him to his current position at Uber, where he is improving the app experience for shoppers. Balancing his love for Legos, video games, and coding, Simon aspires to discover the perfect blend that will propel him forward in the next chapter of his journey. With each line of code he writes, Simon believes he is bridging the gap between his passion for play, his inherent desire to invent, and his pursuit of creating something meaningful.

Edward Hong

Semiconductor
Engineer
TikTok

4:10 // Job interview strategies I've learned

It is critical to expand beyond the typical interview questions to differentiate yourself from others. Ask questions to the interviewer that nobody else would ask that would make you memorable.

Biography

Simon's academic journey began at St. John's U., where he initially pursued a degree in psychology, driven by his interest in non-profit work. However, after graduating, he discovered the emerging world of coding bootcamps and saw an exciting opportunity to join innovative companies and create remarkable things. Enrolling in a bootcamp, Simon launched his fulfilling career in software engineering. His journey since then has brought him to build applications for renowned brands like Shake Shack, ultimately leading him to his current position at Uber, where he is improving the app experience for shoppers. Balancing his love for Legos, video games, and coding, Simon aspires to discover the perfect blend that will propel him forward in the next chapter of his journey. With each line of code he writes, Simon believes he is bridging the gap between his passion for play, his inherent desire to invent, and his pursuit of creating something meaningful.

Panel Discussion: Industry Careers and Interdisciplinary Opportunities (Continued)

Friday 4:00 – 5:00pm | @ Innovation Ballroom C&D

Youngmin Kim

Founder/CEO, iXR Studios
Visiting Professor, Sogang University

4:15 // Hollywood in the Metaverse

My passion for a merging of science, technology, business, and art in the film and immersive media industry has been a driving force behind my work. I would love to share my firsthand experience surviving roller coaster rides in both the immersive media industry and Hollywood.

Biography

Youngmin Kim is a CEO of iXR Studios based in Los Angeles and a visiting professor at Sogang University's Graduate School of Metaverse in Korea. Youngmin is a highly acclaimed writer and director, known for his remarkable portfolio of film projects. His acclaimed short film "*Room 731*" released in 2014, explored the historical events of Unit 731 during World War II, receiving acclaim at 50 prestigious film festivals such as Cannes and the New York Film Festival. Currently, iXR Studios is developing a feature film based on "*Room 731*" titled "*Manchukuo*," set for production in 2024. His mission is to create diverse films that center around Korean and Asian stories while serving as a bridge connecting Korea and Hollywood. Since 2016, Youngmin has excelled as a content creator specializing in immersive media including VR, AR, and MR holographic technologies. He produces captivating intellectual property films and immersive media. He earned an MFA degree in TV & Film Production from USC in 2014 and has been running a startup company for over 7 years.

Focus Group Talks

Friday 5:00 – 6:00pm | @ Innovation Ballroom C&D

Coordinator: Kate Kim

Each speaker gave a 5-minute talk on a professional development topic, then lead a 13-minute discussion/mini-workshop with the participants at the roundtable. Each roundtable focused on a particular topic with three speakers per table. Audience participants are assigned to tables that match the interests indicated in their FIRE google form registration. One speaker per table lead a 20 minute slot, and audience participants move through three rotations (tables). Focus groups enabled participants with specific professional development needs to discuss with experts honing in on their experiences and articulate their insights.

Chang Hyeon (Sam) Lim

Data Scientist
Dow Chemical

Table 1 // Transitioning using Data Science

This session discusses more about types of skills to build and ways to leverage your subject matter expertise to transition yourself to data science fields in your field. The main takeaway of this session is to discover ways for attendees to bring data science skills into traditional industry fields.

JeongYong (Jaylen) Park

PhD Candidate
Texas A&M University

Table 2 // Keeping my passions with career realities

Pursuing a specific interest has led me to take on all sorts of challenges, and let me tell you, they've been valuable experiences that have helped me get closer to my ultimate goal.

Yoonseok Oh

Process engineer
SK Battery

Table 3 // Lessons learned from a manufacturing start-up, from different culture

Two lessons I learned during the beginning of my career are: 1) How to make decisions, 2) The importance of culture and your role

Eugene Kim

MS Candidate
Georgia Institute of Technology

Table 4 // It's OK not to be OK: How Grad School Became my Therapy

With mental health and personal struggles pervailing in young professionals , I share my journey in navigating graduate school as an incoming PhD candidate also struggling with those issues. Seeking a sense of community and finding meaning and purpose in research has greatly helped me regain a sense of meaning and purpose in life and to appreciate the surroundings.

Alex Kang

DMD Candidate
Dental College of Georgia

Table 5 // Confidence Built as a Dentist

As a dental student, I struggled to have the confidence of being a clinician and a provider for my patients. I was about to overcome imposter syndrome by surrounding myself with great mentors and peers who helped build my identity as a dentist and I believe anyone can do the same by being with the right people.

Dahye Kim

PharmD Candidate
University of North Carolina

Table 6 // Cultivating Interview Success: 10 Essential Tips for Young Students Embarking on Their Journey

Presentation will include my journey from a failed interview experience to valuable lessons learned. It will provide ten essential tips for interview success, offering guidance to young students seeking to improve their interview skills and make a lasting impression.

Eunmi (Ellie) Jeong

PhD Candidate
U. of Wisconsin-Madison

Table 7 // The reason why I quit my job after 8 years to study abroad

To achieve success and fulfillment in life, it is essential to establish a clear vision based on your values and pursue it with determination and perseverance. In addition, keep exploring and learning.

Brian Shanahan

Engineer
Primera

Table 8 // Importance of Self-Advocacy in the Workplace

Maintaining healthy boundaries and advocating for oneself as an employee are essential aspects of fostering a positive work environment. Developing personal well-being for your mental health by effectively communicating is crucial.

Yoona Park

Machine Learning Engineer
Apple

Table 9 // Use Imposter Syndrome to Your Advantage

Imposter syndrome can be a motivation to recognize one's fears, learn from others, and acknowledge their efforts.

Crystal Shin

Assistant Professor
Baylor College of Medicine

Table 10 // Permission to publish denied

Permission to publish denied

Focus Group Talks (Continued)

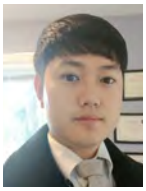
Friday 5:00 – 6:00pm | @ Innovation Ballroom C&D

Jeong-wan Park

Postdoc
Argonne National Laboratory

Table 1 // Passion v graduation

high-risk, high return. Sometimes luck really matters.



MinYoung Yoo

PhD Candidate
Simon Fraser University

Table 2 // How to find meaningful connections between my skills and dreams?

(i) Always look for meaningful connections between your skills and desires; (ii) take a moment and reflect on what you really like, what you are good at, and what you wish to achieve.

Jonathan Young Kim

Lead Software Engineer
Capital One

Table 3 // Applying to the Job You Deserve: Internal vs External

It is a popular strategy to advance in career by switching companies, but don't overlook opportunities that may be available internally.

Changkee Hong

PhD Candidate
University of Central Florida

Table 4 // Understanding American individualism for networking

American students express their opinions frankly but not rude, even warm. Understanding American individualism helps our mental health as well as getting along well with them.

Anna Lee

Director
Prellis Biologics

Table 5 // Navigating the biotech world without a PhD

Working in the biotech industry without a Ph.D has been challenging, but not without its rewards. Everyone's path to success looks different, and we must remain agile in an ever changing industry.

Sangwoo Park

Silicon Design Engineer 2
AMD

Table 6 // Importance of Design Verification in Engineering

Although on the outside design verification seems like an inferior role, it plays a crucial role in engineering projects.

Hye Rin Choi

Data Engineer
Canadian Government

Table 7 // How to use ChatGPT to fine-tune your resume

Using the right prompts will get you better results for fine-tuning your resume.

Jay Han

Engineering Manager
Qualtrics

Table 8 // The necessity of sabbaticals

1. sabbaticals are necessary and worthy to work for. 2. don't be afraid to ask

Yewon Hong

BS Candidate
UC San Diego

Table 9 // Lessons Learned from Leadership, Collaboration to Entrepreneurship

I've learned that the path to proficiency begins with embracing continuous learning, fostering a growth mindset, and valuing collaboration as key to team success. As I transitioned into entrepreneurship, I also discovered the importance of resilience, strategic planning, and leadership.

Andrew Jemin Choi

Software Engineer
Algorand

Table 10 // Into the Woods of Free and Open Source Software (FOSS)

They say that the best things in life are often free. In this session, we will explore how the free and open source culture has advanced many parts of our world, ranging from the creator economy to science, software, and technology. I'll also share my experiences working on open-source blockchain software, how we can continue to foster free science and software, and its impacts on different disciplines.

Gyeonghye Yun

BS Candidate
University of Washington

Table 1 // Life of being Alien in USA

If you lost from your plan, trying to get motivation, and set new plan for your motivation.

Nathaniel Chung

PharmD Candidate
Northeastern University

Table 2 // What more can I do?

By asking yourself 'what more can I do?', you adopt a growth mindset when approaching a challenge. More efficient execution will provide more contentment than the simple feelings of intention.

Wonjae Yoo

Instructional Assistant Professor
Texas A&M University

Table 3 // My journey to achieve a four-year Ph.D. completion in a new field

Establish due dates for your works in advance such as a day, a week, or even a year ahed. Share this due with your advisor so that you can push yourself and improve completeness when real deadline comes.

Min Kyu Lee

MS Candidate, UCLA
Clinical Research Coordinator, California Vascular Research Foundation

Table 4 // Few lessons learned as a Korean immigrant to non-traditional graduate student

Overcome challenges together and never alone. Embrace diversity and learn from other cultures.

Jaehoon Lee

Lead Digital Health Informaticist MITRE Corporation

Table 5 // Paving the Cowpath: The Career Path of Digital Health Informaticist

This talk will cover the introduction of digital health informatics and how expertises from different backgrounds of medicine and engineering work together to innovate digital healthcare.

Seo Yeon (Sunny) Lee

Clinical Research Assistant, BIDMC

Table 6 // Searching for Motivation in Work

In order to motivate yourself in your workplace, you need to first gain a deeper understanding of yourself. Then, this knowledge will guide you in restructuring your work methods in order to gain motivation.

Dong Seok Lee

PhD Candidate
University of Texas at Austin

Table 7 // How to conduct research in unfamiliar research territory

1. Seeking assistance beyond my immediate research environment is important. 2. Interactions with external individuals can provide unexpected guidance and support, ultimately enhancing the quality and efficiency of the research.

Namhyeon Cho

Senior Project Engineer
Barton Marlow

Table 8 // Shape the World You Want to Live in

I want to share my unique career decision in the construction industry from a mechanical engineering major and how it allowed me to build the world I want to live in.

Choux Kim

BS Candidate
Georgia Tech

Table 9 // Bridging the Gap: Merging Art and Technology - Lessons Learned in Professional Development

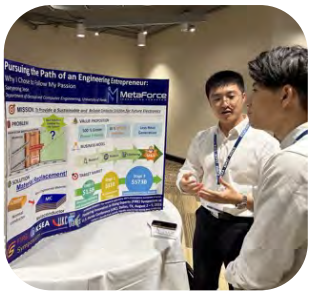
Throughout my academic journey at Georgia Tech, I learned the importance of embracing my unique perspective as a visual artist in a technology-focused environment and leveraging it as an opportunity for innovation. Founding my own company, InterOcci, taught me the value of effective communication, negotiation, resilience, and perseverance in merging art and technology to create meaningful solutions.

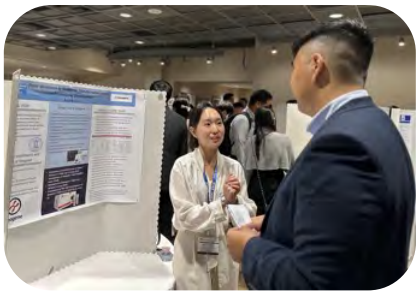
Poster Exhibition

Friday 6:00 – 7:00pm | @ Aviators

Coordinators: Amy Jang & Kate Kim

This presentation avenue featured 5-minute talks accompanied by 4'x3' printed posters on professional development (non-technical) topics. These included industry and academic career trajectories, unique career paths, career transitions, mental health, and challenges in tech. The target audience was the entirety of FIRE Symposium and the broader UKC, as it is held in the same room as technical posters from the Technical Group Symposium. Throughout the 1 hour exhibition, posters were meant to spark open conversations about professional and personal growth areas which typically may not be directly addressed at work or school.





Da-Yeon (Irene) Lee

PhD Candidate
Oklahoma State University

From Food Science to Nutritional Sciences: A Journey Starting from Scratch

Since I changed my major to different field from my master's, it was hard for me at first, and I am still adjusting. However, work experience led me to broaden my academic insights.

Donghyun Lee

BS Candidate
Seoul National University/Georgia Tech

Between Cybersecurity and Aging

If we can handle strong deficiencies in a healthy manner, they can become the strongest motivation of all. Constantly criticize and scrutinize everything (especially my own thoughts and choices), seek information relentlessly, and raise questions.

Emily Han

BA Candidate
Rutgers University

User Needs and Technology

I am currently working at a nonprofit that helps people overcome addiction. I hope to learn more about people's tech. needs and make the experience more intuitive for those who are not technologically adept.

Hojoong Kim

Postdoc
Georgia Institute of Technology

Do what you love, consider the most important values, and keep getting new good stimuli in your life.

Three years have passed since I finished my Ph.D in Korea and took a postdoc in the US. I have achieved some remarkable results and it is time to catch the next carrier. In determining the future, it was helpful to organize the values I consider the most important.

Hyukin Moon

BS Candidate
UC San Diego

Unveiling Passions and Pioneering Paths

Going to college meant more than a major and a degree. It was a journey of self-discovery: finding my true passion and painfully acknowledging my weaknesses.

Inah Gu

PhD Candidate
University of Arkansas

How I chose my major and advisor/lab

I learned how to find my advisor and laboratory for Master's and Ph.D. program based on my interests.

Jonathan Kim

Data Scientist
Meta

Embracing Transformation: From Industrial and Labor Relations to Consumer Finance and Data Science at Meta

My career journey from Industrial and Labor Relations to consumer finance and data science has taught me the importance of embracing change, following my passion, and continuously learning in an evolving professional landscape. By leveraging diverse skill sets and staying agile, I have discovered fulfillment in using data to drive strategic decision-making and create meaningful experiences for users.

Matthew Jeon

Staff Research Associate
U. of California, San Francisco

Navigating Career Paths: MD, PhD, and MD/PhD

For many students, choosing between a career in medical practice and academic research can seem like a daunting task. However, the emergence of physician-scientist roles has created new opportunities. Gain insight into the distinctive aspects of these careers, their societal roles, and how students can navigate the given resources to find what is right for them.

Min Joo Kim

BS Candidate
Vanderbilt University

How to navigate through your undergraduate life as an asian/ international student

I learned the importance building self-belief and to be open to failure. I have also learned how to ask for help and find support group.

Myeongsoo Kim

PhD Candidate
Georgia Institute of Technology

Promoting Effective Collaboration: Key Strategies for Success in Research Environments

Successful collaboration in research environments depends on cultivating a mutually reinforcing competitive spirit, establishing clear shared objectives, sustaining open and honest communication, and implementing structured dialogues along with rule-setting. When adopted effectively, these strategies not only assist in overcoming challenges but also foster individual learning, overall team growth, and improved performance.

Rachel Chun

PharmD Candidate
UNC Chapel Hill

From Workforce to Academia: Transformative Lessons in Professional Development

Returning to UNC Eshelman School of Pharmacy after work experience in Seegene has transformed my professional development, teaching me the importance of embracing change, humility, and curiosity while fostering resilience and determination. This journey has shaped me into a well-rounded professional, ready to make a meaningful impact in my field.

Poster Exhibition (Continued)

Friday 6:00 – 7:00pm | @ Aviators

Riky Bae

BS Candidate
Rutgers University

Baby Steps!

I learned how to effectively problem solve during my time at tesla. Also learned how to overcome initial fears when starting new jobs. Learned the importance of approaching problems methodically and how to adapt to stressful situations.

Saeyeong Jeon

PhD Candidate
University of Florida

Pursuing the Path of an Engineering Entrepreneur: Why I Chose to Follow My Passion.

I have decided to pursue entrepreneurship as a way to value what I think is important and use my knowledge to create a company specializing in low-loss conductors for high-frequency applications. I believe this path will make me a better human being, regardless of the results, and am excited about the possibilities that lie ahead.

Sungyun Yang

PhD Candidate
MIT

Navigating Uncertainties in the Journey Towards a Ph.D.

Embrace new challenges as opportunities. What seems overwhelming at the start can, with perseverance, lead to greater success and achievement.

Uijeong Jo

PharmD Candidate
UNC Chapel Hill

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Venessa Mak

BS Candidate
UTMB

Designing Tomorrow: The Intersection of Creativity and Healthcare

Discovering opportunistic solutions to medical challenges and revolutionizing patient care with healthcare innovation.

Yongwan Cho

BS Candidate
Kalamazoo college

computer science and learning science

I believe that educational software can be developed to provide personalized learning experiences for students from diverse backgrounds.

Award Ceremony and Closing Remarks

Saturday 9:30 – 10:00am | @ Innovation C&D

Coordinators: TJ Park, James Han, DK Kim

Poster Exhibition

1st Place ($150 Springer Certificate)

Matthew Jeon
Staff Research Associate
U. of California, San Francisco

2nd Place ($50 Amazon Gift Card)

Riky Bae
BS Candidate
Rutgers University

3rd Place ($30 Amazon Gift Card)

Venessa Mak
BS Candidate
UTMB

Career Flash Talk

1st Place ($100 Amazon Gift Card)

Inyoung Cheong
PhD Candidate
University of Washington

2nd Place ($50 Amazon Gift Card)

Jenny Namkoong
Interventional Cardiology Fellow
Univ. of Manitoba

Honorable Mention (Certificate)

Hyoungjin (Harry) Park
BS Candidate
USC

KSEA NG VISION Awards

Visionary

Ryuhwa Stella Kim
Manager
Data SC, Inc

Inclusivity

Younggyun Kim
BS Candidate
USC

Sustainability

Clara Kim
Senior Manager
Astellas Pharma US

Impact

Jinho Park
Postdoc
University of Florida

Outreach

Taegon Jay Lee
Data Visualization Engineer
DoD

Outreach

Amy Jang
Pharmacist
Boston Children's Hospital

YG Groups of the Year

University of Michigan University of Southern California Georgia Tech University of Wisconsin

Honorable Mentions

Inclusivity - TJ Park

Sustainability - Matthew Jeon

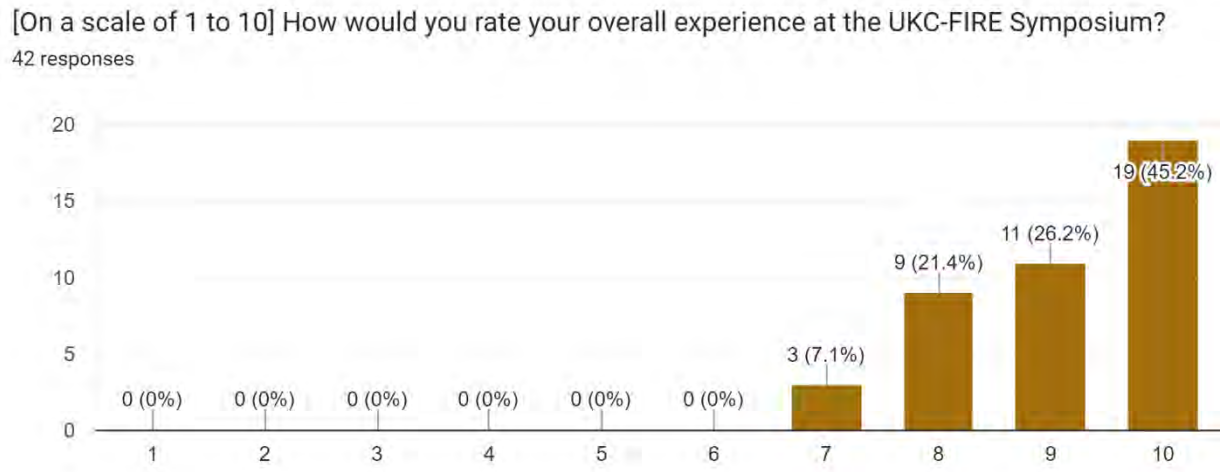
Impact - Mujin Kim

Outreach - Angie Jung, Hye Min Kim, Andy Kim

Neo - Harry Park, Taeyoon Park, Jonathan Y. Kim

YG Groups - UCLA, Seattle, Rutgers, UC San Diego

Post-Conference Participant Feedback



Focus groups were a creative and great idea!

***I appreciate all your support!* 진행에 힘써주신 모든 분들께 감사드립니다.**

Exceeded expectations, thank you so much!

One of the best and most unique conferences I ever attended since it focused on personal development (rather than a field of study), often overlooked but something that likely has the most effect on a person's life and career. The different venues of presentation kept the content fresh and interesting [...] I had no negative experiences during the entire conference and every participant I met was engaged, professional, and respectful. I also just wanted to personally thank the chair & organizers - it is obvious tons of time, effort, and heart went into planning and executing this conference and this is evident in its overwhelming success - thank you all!

Many many thanks for the organizers for making FIRE 2023 such a memorable experience!! You guys are rockstars :)

DSW (Data Science Workshop) Report

Data Science Workshop

Machine Learning on Biomedical Data

August 5 _ Saturday _ 1:30-6:00pm _ Innovation Ballroom C&D

Chair

Benjamin Lee

Senior Research Associate at Weil Cornell Medicine

Co-Chair

June Park

Data Engineer at Daugherty Business Solutions

1. About the Forum

The 4-hour Data Science Workshop (DSW) at UKC 2023 was held in Dallas, TX on Saturday, August 5, 2023, from 1:30–6:00pm CDT at the end of UKC. The sixth DSW held at UKC aimed to provide a hands-on crash-course on data science, machine learning, and deep learning for those UKC attendees with little to no prior data science experience. This year's workshop had 29 paid registrants ($70 regular and $35 student) and 20 total attendees during the workshop. Of the participants, 45% were faculty or researchers from academia, 25% were industry professionals, 25% were graduate students, and 5% were undergraduate students. While 80% attendees were from the United States, 4 or 20% of attendees were from Korea.

This year's DSW was themed "*Machine Learning on Biomedical Data*" which was open to all non-biomedical and biomedical backgrounds. Also, this year's workshop had a new format with participants working on team-based mini-project from start to finish of a data science problem using real-world biomedical data. Participants begin with data cleaning, build a machine learning model, and end with presenting their own trained model. Instructors assisted teams of 2-3 participants on each mini task to achieve the final goal of training a machine learning model and presenting it. Participants were required to have some programming experience with Python preferred. The computing environment used was the free Google Colab using the Python programming language.

The first half of the program was the "*Data Analysis of Tabular Biomedical Data*" session from 1:30-3:45pm. This included an introduction to data science basics and machine learning concepts such as the definition of AI vs machine learning vs deep learning, supervised vs unsupervised, accuracy vs interpretability. Participants also performed hands-on review of data handling using the Pandas package and machine learning models including logistic regression, random forests, and gradient boosting using the SciKit-Learn package on a real-world breast cancer histopathology tabular dataset.

The second half of the program was the "*Machine Learning Modeling and Project Presentations*" session from 4:00-6:00pm. Two new biomedical datasets were provided which included the "*Heart Failure Prediction*" and "*Fetal Health Classification*" datasets. Team members chose one dataset that provided cleaned data and trained machine learning models with code from templates. Four instructors and teaching assistants went around the room to help the team members. At the end of this session, teams created and presented their slides describing their model building process and performance results. At the conclusion, a bonus demonstration of deep learning models such as artificial neural networks and convolutional neural networks for image classification were presented and discussed. All participants were able to keep a copy of their code on their personal Google drives for future reference.

The instructors and teaching assistants included Benjamin Lee (Sr. Research Associate, Weill Cornell Medicine, NY), June Park (Data Engineer, Daugherty Business Solutions, TX), DK Kim (Senior Data Analytics Consultant, Zurich North America, IL), and Karl Kwon (Engineering Lead, MITRE, NJ). This year's team-based Data Science Workshop with a focus on biomedical data was a success, and we hope to reach more UKC attendees and KSEA members who wish to gain hands-on practical experience in data science in various fields.

Testimonials of participants

"Though brief, the Data Science Workshop was an invaluable experience. I extend my gratitude to the organizers and instructors!" - Hakjoo Kim (Ph.D. Student, Texas A&M University)

"I would highly recommend the workshop for researchers trying to learn and start using data science for their research. DSW was a well-organized workshop for beginners. Short project at the end was especially helpful and I felt I should be able to tackle more complicated projects in the future. Also, other online resources (YouTube, forums, etc.) should now make more sense to me when I try to learn something more specific for my research need." - Hyun Jin Kim (Assistant Professor, University of Alabama)

2. Group Photo

Participants and instructors of the Data Science Workshop at UKC 2023

Mid-Career Lunch and Networking

Mid-Career Lunch and Networking

August 3, 4 _ Thursday and Friday _ 12:30-1:30pm

Chairs

Hyojin Kim

Associate Professor
New Jersey Institute of Technology

Brian Byungkyu Park

Professor
University of Virginia

1. About the Networking

KSEA hosted two mid-career development workshops held virtually: the first on June 23, 2022, and the second on February 23, 2023. These workshops were designed for individuals seeking to refresh their academic careers by facilitating the exchange of personal experiences through panel discussions and fostering connections among peers. The mid-career lunch and networking event at UKC 2023 served as an in-person follow-up gathering for workshop attendees and other UKC participants.

The initiative was co-led by Prof. Hyojin Kim (Associate Professor, New Jersey Institute of Technology) and Prof. Brian Park (Professor, University of Virginia). This event provided a platform for attendees to meet esteemed senior mentors, thereby enhancing their professional network connections with both mentors and peers.

The mid-career lunch and networking event at UKC 2023 took place on August 3 (Thursday) and August 4 (Friday), from 12:30 PM to 1:30 PM. This unique lunch program, a first-time addition to UKC, was arranged to create a semi-informal setting. Esteemed senior mentors, including the three UKC 2023 keynote symposium chairs and two senior KSEA members with distinguished careers, actively engaged with attendees, sharing their invaluable experiences. The senior mentors who participated in this lunch program include Prof. Youngsup Yoon (Professor, Emory University) and Prof. Jungsang Kim (Professor, Duke University) on August 3 (Thursday), and Dr. Jae Hoon Kim (Executive/Senior Technical Fellow, The Boeing Company), Prof. Young-Shin Jun (Professor, Washington University in St. Louis), and Prof. Young-Kee Kim (Professor, University of Chicago) on August 4 (Friday).

About 30 participants attended each day's lunch program. Attendees have shown a strong interest in a follow-up online panel discussion focusing on tips and strategies for transitioning between institutions or negotiating retention packages. Attendees have also expressed a strong interest in fundamental inspiration. The list of participants, along with their personal website/LinkedIn URLs, and event photos, has been shared among program attendees with the intention of promoting ongoing networking and fostering connections with senior mentors and peers. This program has also received highly positive feedback. All participants in the post-event survey have expressed their willingness to attend similar events in the future and to recommend this event to their colleagues.

2. Group Photos






Distinguished Forum Report

Seegene Medical Foundation (SMF) Distinguished Forum

Leading the Global Healthcare Market with Digital Healthcare

August 3 _ Thursday _ 1:30 _ Room Dallas

Chair

Min-Cheol Lee

Vice Director
Pathology Center
Seegene Medical
Foundation (SMF)

Co-Chair

Sung Yun Jung

Associate
Professor
Baylor College
of Medicine

1. About the Forum

Seegene Medical Foundation (SMF) is a large independent reference laboratory in South Korea that offers over 4,500 testing services, including routine laboratory tests, molecular tests, pathological diagnosis, and clinical research. It also operates the largest molecular diagnostic test center in South Korea and has tested over 63 million people for COVID-19 since 2020.

SMF is exploring diagnostic values through several research institutes and has a grand vision to become a leader in digital healthcare by leveraging big diagnostic data. To this end, it is promoting overseas expansion in the United States, Europe, Southeast Asia, and Central Asia. SMF plans to diagnose and prevent diseases through IT-based digital healthcare services, and even provide treatment services.

At this forum, the results of disease diagnosis development research using big data and artificial intelligence were discussed. SMF also introduced an Open Healthcare business model for overseas expansion.

2. Introduction and Welcoming Remarks

Dr. Yongho Sohn, President of the Korean Society of Engineers in America (KSEA), gave welcoming remarks at the beginning of the event. He expressed his gratitude to Seegene for sponsoring UKC2023 and welcomed the audience. Min-Cheol Lee, Vice Director of Seegene Medical Foundation, and Dr. Sung Yun Jung, Forum Co-Chair, then introduced the speakers. One speaker was from the United States, and five speakers were from Korea.

3. Presentations

Dr. Tae Hyun Hwang, Chair Professor of the Mayo Clinic, presented a talk titled "Redefining Boundaries: Harnessing AI to Illuminate Novel Blood-Based Diagnostic, Prognostic, and Predictive Biomarkers and Therapeutic Targets for Immuno- and Cellular Therapy."In his presentation, Dr. Hwang explained how single-cell and spatial genomics, in conjunction with machine learning and artificial intelligence (AI), can revolutionize the identification of biomarkers and the development of personalized immunotherapies for cancer treatment. He showed how, by analyzing sequential single-cell CAR-T and peripheral blood mononuclear cell (PBMC) data from patients who have received CD19 CAR-T cell therapy, he was able to identify novel biomarkers and combinatorial therapies. He also discussed AI-guided biomarker discovery and therapeutic strategies that are specifically tailored to gastric cancer immunotherapy.

Dr. Jongmun Choi, Lab Director of the Department of Diagnostic Laboratory at SMF, presented on the topic of "How to gain insights in the interpretation of clinical genomics using visualization of genetic big data?" He explained SMF's current efforts in developing data mining tools using AI-driven software development.

Dr. Youngjin Park, Research Scientist at SMF, presented on the topic of "A Sustainable and Workable Deep Learning-based Clinical Assistant Diagnosis System for Digital Pathology." He demonstrated SMF's efforts in developing AI systems that support decision-making for real-world problems, taking into account the uncertainties involved.

Mr. Suk Min Ha, Research Scientist at SMF, presented on the topic of "Multi-Organ Cell Segmentation with Watershed algorithm to automatically calculate Tumor Cellularity." In his talk, he showed the advanced technology developed by SMF to process clinical images using Watershed segmentation. He demonstrated how SMF's advanced technology has made the Watershed segmentation method relatively simple to implement and can be used to segment images with a wide range of complexities.

Dr. Haiyoung Jung, Division Director of Laboratory Business at Open Healthcare Inc., introduced Open Healthcare Business as a referral laboratory service and total healthcare platform as part of SMF's efforts to expand overseas. She explained that SMF is exploring diagnostic values through several research institutes, including the Immune Research Institute, the R&D Center for Clinical Mass Spectrometry, the Molecular Diagnostic Research Center, and the AI Research Center. SMF has a grand vision of becoming a leader in digital healthcare by leveraging big diagnostic data collected from its in vitro diagnostics services overseas.

4. Penal Discussion

After the five presentations, the forum participants had a 30-minute open discussion. Most of the participants expressed their interest in the development of AI-driven diagnostic methods, as presented by Dr. Hwang and SMF. Some participants discussed Open Healthcare Inc.'s plans to expand their services overseas. All of the participants looked forward to building a collaborative relationship with SMF in the future.

5. Group Photos

CHEY Distinguished Forum Report

New Era of Space Exploration

August 3 _ Thursday _ 1:30pm _ Enterprise Ballroom

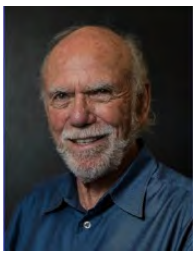
Chair

Young-Kee Kim
Louis Block Distinguished Service Professor
University of Chicago

Co-Chair

In Kook Park
President of CIAS

Presenters



Barry Barish
Nobel Laureate
Caltech, UC Riverside

Daniel Scheeres
Distinguished Prof.
University of Colorado Boulder

Hyochoong Bang
Professor, KAIST

1. About the Forum

The Chey Institute for Advanced Studies presented the forum "*New Era of Space Exploration*." This forum aims to illuminate the latest advancements in space science and technology. Distinguished speakers, including Nobel laureate Barry Barish, renowned for his groundbreaking work on the discovery of gravitational waves, Daniel Scheeres, an esteemed expert in celestial mechanics from the University of Colorado Boulder, and Hyochoong Bang, a leading researcher in aerospace engineering at KAIST, shared their expertise. By exploring new frontiers, we anticipate fostering collaboration, exchanging knowledge, and inspiring further advancements in our understanding of the universe.

2. Introduction and Welcoming Remarks

President In Kook Park gave welcoming remarks and introduced CIAS, which focuses on geopolitical risks, scientific innovation, and their impact on geopolitics. He highlighted Republic of Korea's advancements in space research, indicating its potential in the "New Space Era." The forum aims to inspire collaboration and wisdom among participants from the Korean-American Scientists and Engineers Association.

3. Presentations

Barry Barish's lecture titled "*Exploring the Universe with Gravitational Waves*" delved into the remarkable progress made through LIGO observations. He highlighted LIGO's ability to pinpoint gravitational wave sources in the sky by measuring their arrival times at different observatories. Topics included the potential for multi-messenger astronomy combining gravitational wave and electromagnetic observations, and the frequency coverage of gravitational wave detections. Barish also discussed concepts like pulsar timing arrays for detecting supermassive black hole pairs and the potential signals from inflation, dark matter, or cosmic defects. The talk touched on LISA's significance and its technology demonstration through LISA Pathfinder. Overall, the lecture underscored the exciting exploration of the universe via gravitational waves.

Daniel Scheeres' lecture titled "*Asteroid Exploration: Recent Progress and Future Prospects*" covered various aspects of asteroid research. He introduced asteroids and their significance as remnants of the early solar system that have influenced Earth's history. The talk highlighted the interest in near-Earth asteroids as potential destinations for future human exploration missions due to their accessibility. The discussion also touched on the growing interest in asteroid resources by both startups and NASA. Scheeres underscored the societal impact of asteroids, citing their potential for collisions and historical extinctions. Notable missions like Hayabusa, Hayabusa2, OSIRIS-REx, DART, and HERA were mentioned, as well as upcoming exploration missions like Lucy and PSYCHE. The lecture concluded by addressing potential challenges, exemplified by the case of Asteroid 1950 DA and its impact probability, emphasizing the need to address such concerns.

Hyochoong Bang's lecture on "*Satellite Proximity Navigation for Space Debris Removal Mission*" addressed the escalating issue of space debris and its risks, highlighting alarming statistics of debris sizes and speeds that pose threats to satellites and spacecraft. He discussed the consequences of debris collisions and cited the Kessler Syndrome. The lecture focused on the challenges of rendezvous and docking for debris removal, emphasizing the need for guidance, navigation, and control (GN&C) technology. The lecture further delved into the specifics of spacecraft relative motion, pose estimation, and pose tracking using monocular vision. In conclusion, the lecture highlighted the algorithm's effectiveness for uncooperative spacecraft and underscored the importance of robust feature detection and filter coupling for accurate pose determination.

4. Open Discussions

During the open discussion moderated by Prof. Young-Kee Kim, several experts were posed questions related to their respective fields. Barry Barish discussed the influence of LIGO's gravitational wave detections on science, technology, and funding decisions for the space-based observatory LISA. Daniel Scheeres shared insights on the intersection of asteroid missions with scientific exploration and commercial interests, along with the potential for asteroid mining. Hyochoong Bang focused on technological advancements and the role of AI in space debris removal missions. Common discussion themes included future projections for respective fields, the significance of international collaboration in space exploration, and ways to enhance cooperation between Korea and the US.

5. Group Photos

KEIT Distinguished Forum

Forum on Global Technology Strategy

August 3 _ Thursday _ 1:30pm _ Room Grapevine

Chair

Jeongwon Park

Professor
University of
Nevada Reno

Co-Chair

Sunghwan Park

KEIT US

1. About the Forum

The UKC 2023 KEIT (Korea Evaluation Institute of Industrial Technology): Global Technology Strategy Forum and Future Mobility Forum were designed to provide the Ministry of Trade, Industry and Energy (MOTIE)'s R&D roadmap and KEIT's policies and programs for promoting the emerging industries with a focus on four industrial technology areas such as Biomedical, Materials, Batteries, and Autonomous vehicles. Korea Evaluation Institute of Industrial Technology (KEIT) is the leading organization contributing to the growth of the manufacturing industry through the development, application & commercialization of manufacturing technologies and supports for SMEs in Korea. Its roles include planning, assessing, and managing national industrial R&D programs under the MOTIE. Since 2014, KEIT, along with MOTIE, has organized the KEIT Research Strategy Forum (KEIT Forum). By promoting the participation of Korean-American scientists and engineers in the planning of Korean national R&D projects, we hope to improve productivity and global cooperation in its R&D programs. To better identify and promote creative and innovative ideas for its national R&D projects planning, the major industry and technology trends will be discussed with Korean-American scientists and engineers in various areas and Korean government organizations, including KEIT.

With the increasing importance of international collaboration, this Forum's goal was to provide a platform to introduce the latest MOTIE's R&D roadmap and future collaborations enabled by these technologies. This Forum brought together KEIT teams, scientists, and engineers from the US and Korea, promoting the opportunity for information exchange and research collaboration between these two vibrant communities. The KEIT's Global Technology Strategy Forum covered the area of Advanced Manufacturing, Biomedical, Materials, Batteries, Semiconductors and Autonomous vehicles. The KEIT's Future Mobility Forum was focused on Autonomous vehicles and Batteries, including KEIT- Southwest Research Institute (SWRI) MoU.

The Forum, held on August 3rd and 4th, 2023, comprised two distinct sessions (KEIT Global Technology Strategy Forum and Future Mobility Forum) and individual meetings with KEIT PDs and researchers, dedicated to MOTIE's R&D roadmap and KEIT's policies and international collaboration future mobility programs including KEIT-SWRI MOU activities for Batteries and Autonomous vehicles. The event featured a comprehensive program encompassing a total of three sessions in the KEIT Global Technology Strategy Forum. For the demographic information, 4 talks were from the US, and 3 talks were from Korea among the contributed talks, which also included 4 from academia, 2 from research institutes, and 1 from KEIT with several discussions with participants from industry.

The quality of presentations from speakers was consistently impressive. The symposium was a platform that effectively highlighted the most recent MOTIE's R&D roadmap and KEIT's policies and international collaboration plans. With a primary focus on KEIT's Global Technology Strategy, the forum provided a dynamic and inclusive forum for intellectual exchange and collaborative growth.

In addition to the formal sessions, an in-person meeting with KEIT PDs and researchers facilitated informal discussions among select forum participants. This gathering allowed for a diverse range of conversations that spanned materials science, engineering, and the prospects of future technological advancements. Subsequently, participants of the KEIT forums were afforded further networking opportunities during lunch time, reinforcing the collaborative spirit that underpinned the forum's overarching objectives.

The KEIT Global Technology Strategy Forum and Future Mobility Forum epitomized a convergence of innovative minds, offering a platform for the exchange of transformative ideas and insights. Through these presentations, discussions, and collaborations, the forums encapsulated the pioneering spirit driving progress in collaborations among the US and Korea researchers in coming years.

2. Group Photos

KHNP (Korea Hydro & Nuclear Power) Distinguished Forum

Forum on Carbon Zero with Nuclear Energy

August 3 _ Thursday _ 1:30pm _ Room Hobby

Chair

Hyungook Kang

Professor
Rensselaer Polytechnic Institute

Co-Chair

Hocheol Shin

Head
KHNP CRI

1. About the Forum

CO2 reduction, ultimately for Carbon neutrality, gains more and more support not only from scientific communities but also from the public world widely. This forum focuses on achieving carbon neutrality through the utilization of nuclear energy, specifically emphasizing the role of small modular reactors (SMR). Currently, Korea Hydro & Nuclear Power (KHNP) is developing an innovative SMR, under the project entitled i-SMR (Innovative Small Modular Reactor) and merging i-SMR technologies into a conceptual platform of a zero-carbon city, named SSNC which abbreviates i-SMR Smart Net zero City. The SSNC model uses i-SMR as a multi-purpose energy source.
Through this forum, the necessity and contribution of small nuclear reactors in the green energy era was analyzed and the extended role of nuclear energy for ocean applications was also addressed. Specifically, the i-SMR design and the SSNC digital model shared technical insights with UKC members regarding the effective and optimized use of nuclear energy for zero carbon society.

2. Introduction and Welcoming Remarks

Mr. Hocheol Shin (Head, KHNP CRI) gave welcoming remarks at the beginning. He emphasized the importance of nuclear as a no CO2 emitting source of energy and its unique future applications for the sustainable development of society. Dr. Hyun Gook Kang, as the chair of the forum, introduced the forum speakers and the contents of presentations.

3. Presentations

Dr. Deokwoo Nam (Senior researcher, KHNP CRI) briefly introduced the goals and activities of KHNP as one of the largest nuclear power plant operators in the world. Since KHNP is in charge of design, construction, and operation of nuclear power plants in Korea, its leading role in SMR development is crucial.

Dr. Hyun Gook Kang (Professor, Rensselaer Polytechnic Institute) presented the background of operational goal changes from the conventional full-power operations to the harmonized operation with other renewable resources which have intermittency by their nature. Sustainability of nuclear energy was also addressed. Considering the changed operational demand, the flexible operation of conventional large commercial reactors and the multi-module operation of SMRs became an obvious future direction of industry changes. He emphasized the back-up role of nuclear energy which enables the extended use of natural resources such as solar and wind.

Dr. Howard H. Chung (retired researcher, ANL and Univ. of Chicago) introduced the possible extended applications of nuclear energy for propulsion in ocean applications. Existing cases such as ice-breaking ships for anti-artic development were reviewed, and Korea-specific development direction was discussed. While various plant options including floating nuclear power plants can be considered and their usefulness was demonstrated by existing application cases, nuclear energy is also expected to provide its unique contribution on the ocean development over the harsh environmental nature of ocean transportation.

Dr. Jiyong Oh (Principal researcher, KHNP CRI) introduced the important enhancements of i-SMR which is under development now in Korea under Korean government's support. In terms of domestic needs and for export, KHNP is planning to create a standard model (typically 170 MW electric per module) of i-SMR by 2028 in collaboration with many organizations including KAERI and KEPCO-E&C. Thanks to the advanced safety features of i-SMR such as passive core cooling capability, it would be

expected to achieve practically-zero risk. For the timely development and deployment, the regulation and licensing scheme for this new type of reactors must be developed at the same time.

Dr. You Hyun Jang (Manager, KHNP digital solution division) provided an overview of Smart net zero city concept and KHNP's development direction. A case study for a small city nearby the industrial area which aims to construct a new airport was discussed and a digital analysis model was demonstrated. Since this area is remote from water and electricity supply, to accommodate a large facility like an airport, the use of nuclear energy from a SMR would be a very promising option for electricity generation, hydrogen generation, district heat, and desalination. Dynamic computer simulation for various combinations of options was also demonstrated.

4. Group Photo

KIAT K-TAG Distinguished Forum

USA Annual General Meeting on Promotion of KOREA-US Technical Cooperation

August 3 _ Thursday _ 2:00pm _ San Antonio

Chair

Byung Joo Min

President
KIAT

Co-Chair

Jong Y Park

Moffitt Cancer Center

1. About the Forum

The Korea Institute for Advancement of Technology (KIAT) is a comprehensive technology support organization committed to promoting industrial technology growth in Korea. Korea-Technology Advisory Group (K-TAG) USA launched by KIAT in July 2014, consists of Korean science and engineering experts in USA. Main activities of K-TAG are 1) to assist Korean Small and Medium-sized Enterprises (SMEs) in finding USA Innovative partners, 2) to provide advice as well as information related to Korea-USA R&D cooperation and 3) to develop and participate in Korea-USA joint R&D projects. In the UKC 2023, the members of K-TAG USA in various technical areas will get together to 1) seek research collaborations, 2) present/propose innovative research projects and 3) discuss R&D program planning with delegates of KIAT in this forum.

2. Introduction and Welcoming Remarks

In UKC 2023, the K-TAG USA members, invitees, and researchers interested in K-TAG from various technical areas gathered for the sponsor forum in the San Antonio Room at 2:00 pm, August 3, 2023. The President of KIAT, Dr. Min (president, KIAT) and Dr. Jang (Vice Minister, MOTIE), gave opening remarks. This year, Korean government recognized K-TAG members with MOTIE minister's awards; Drs. Jong Y Park (Moffitt Cancer Center), Byung-Guk Jun (Purdue University), and also KIAT recognized K-TAG members with K-TAG USA Awards; Drs. Duk Ho Kim (Johns Hopkins), and Sunkyu Park (North Carolina State University).

3. Presentations

KIAT Global R&D Cooperation Program officers, Jinha Kim and Chun Gyo Park, introduced KIAT Global program to K-TAG USA. KIAT Chief Representative, Dr. Eunjung Kim, presented K-TAG USA and highlighted K-TAG's activity since the last report (Dec. 2022).

Afterward, there was a productive open discussion with vice minister (MOTIE), president of KIAT and all participants. During this time, KIAT President, vice minister and relevant directors listen to difficulties that K-TAG members have and respond with instant helpful feedbacks. It became informal as they continued with the networking session.

Like the UKC2022, it was an excellent meeting, since KIAT President, vice minister and relevant directors were physically participated in the forum to discuss with K-TAG members on various issues, such as availability for international collaboration project. KIAT team provided feedbacks and guidance.

4. Group Photos

KITECH Distinguished Forum

Forum on Additive Manufacturing

August 3 _ Thursday _ 1:30 _ Room Houston

Chair

Kwang Jin Lee

Director
KITECH USA

Co-Chair

Haseung Chung

Michigan State University

1. About the Forum

Additive manufacturing, commonly known as 3D printing, is progressing rapidly to revolutionize the advanced manufacturing landscape by providing new ways to design component with on-demand and on-site capability. KITECH Distinguished Forum highlights state-of-the-art status on additive manufacturing for various applications including multi-functional (e.g., structure with sensors embedded) and seeks collaborative environment to advance fundamental knowledge in additive manufacturing science.

2. Introduction and Welcoming Remarks

Dr. Kwang Jin Lee (Director of KITECH USA) gave welcoming remarks at the beginning and introduced KITECH to the audience. Dr. Ha Seung Chung (Professor of Michigan State University) introduced two speakers from the South Korea and one speaker from the U.S.

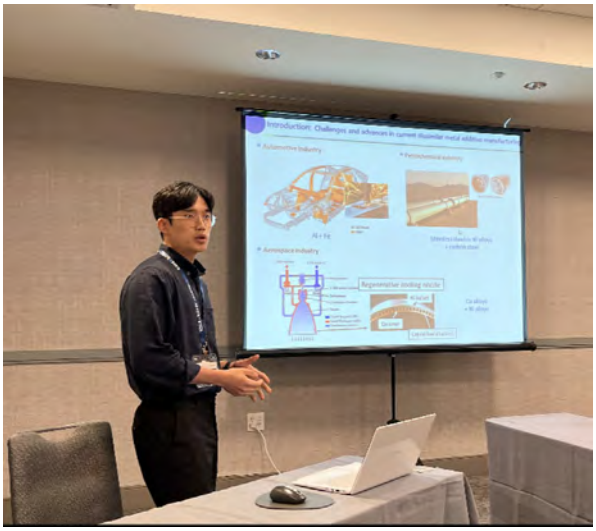
3. Presentations

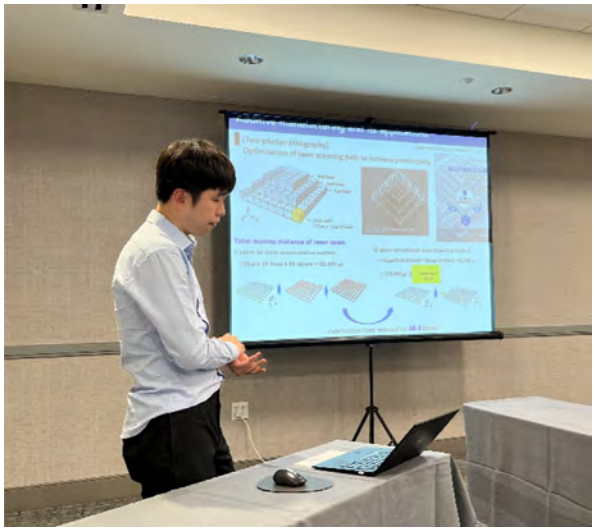
Dr. Cheol Woo Ha (Senior Researcher of KITECH) gave a brief explanation about Korea Additive Manufacturing Innovation Center(KAMIC) of KITECH. He introduced various industrial 3D printing systems KAMIC possesses and R&D projects they are working on now. Dr. Ha elaborated on micro nano 3D printing, emphasizing his special interest in two-photon lithography. In addition, he explained how additive manufacturing is applied to increase productivity and improve yields. Two-photon lithography optimizes laser scanning path, DLP uniforms UV light exposure from build plate, and finally SLA develops monitoring system for high process yield.

Dr. Du Rim Eo started his presentation with challenges in current dissimilar metal additive manufacturing. Three major challenges he assumed were (1) lack of universal criteria for hot crack susceptibility, (2) role of secondary phase precipitation during the solidification, (3) lack of study on the mechanical properties of the interface. Then he suggested two possible solutions to overcome such issues by presenting case studies he experimented. First solution was that more accurate and universal index for hot crack susceptibility is needed. Second and last, more studies should be conducted to verify the integrity of the interface at diverse loading conditions to simulate the actual metallic part working environment.

Dr. Holden Hyer introduced Oak Ridge National Laboratory and its R&D outcomes in nuclear field. His presentation was mainly focused in presenting a case study of functional sensor embedded in metal additive manufacturing.

4. Group Photos





K-Water Distinguished Forum

Forum on Ultra High Purity Water

August 3 _ Thursday _ 1:30pm _ Room Carter

Chair

Hyeon Sik Kim

Vice President & CRO(Chief Research officer) of K-water Research Institute

Co-Chair

Soyoon Kum

Assistant Professor at Angelo State University

1. About the Forum

Ultrapure water is used for advanced industries such as semiconductor, LCD, and Solar panel manufacture. To produce UPW (Ultrapure water), the source water must be treated with various water treatment technologies, and the process requires high operation technology. Thus, UPW production is recognized as leading-edge technology in the water industry and high-value-added industrial water. The Korean government has recently declared to promote the Semiconductor industry for national security and economic growth. For the semiconductor industry, ultrapure water is an essential resource. Therefore, key technologies and strategies to promote UPW technology were discussed during the K-water Special Forum.

2. Introduction and Welcoming Remarks

Hyeon Sik KIM (CRO(Chief Research officer) of K-water Research Institute) gave welcoming remarks initially. Dr. Soyoon Kum (Forum Co-Chair) introduced two speakers from the U.S. and three from Korea.

3. Presentations

Following the welcome remarks and speaker introduction, Dr. Jaehong Kim (Professor, Yale University) introduced "*Membrane-Confined Heterogeneous Advanced Oxidation*." Heterogeneous advanced oxidation processes (AOPs) are a well-known water treatment technology and allow for the destruction of aqueous organic pollutants. Still, the low availability of short-lived radicals in aqueous bulk decreases the treatment efficiency. To overcome this challenge, Dr. Kim suggested Membrane-Confined Heterogeneous Advanced Oxidation by loading various catalysts within the pores of a ceramic ultrafiltration membrane, resulting in an internal heterogeneous Fenton reaction that can efficiently degrade organics materials in water. The suggested technology can successfully reject natural organic matter and selectively expose smaller organics to radicals and has the potential to apply to produce ultrapure water.

Dr. Young-shin Jun (Professor, Washington University in St. Louis) presented "*Photothermal Membranes for an Environmentally Sustainable and Resilient Clean Water Supply*." Photothermal membrane uses solar energy for light-to-heat conversion and treats saline water by membrane distillation method with the produced heat. In these water purification processes, the light absorption and light-to-heat conversion of photothermal materials are important factors in determining membrane efficacy. Dr. Jun introduced developed membranes with nanomaterials that can increase light absorption and photothermal conversion. She mentioned that membrane distillation could be a possible treatment option for ultrapure water because this technology may effectively remove concerned organic matters in ultrapure water. The third speaker was Dr. Kyung Hyuk LEE (Head Researcher of K-water Research Institute). He presented "*Promotion of Ultrapure Water Technology for Semiconductor Industry in Korea*." He introduced a broad view of ultrapure water projects in Korea, current project status, and future plans. Dr. Lee showed an ultrapure water treatment pilot plant in Korea. This treatment plant was designed by Korean, which is a remarkable step in Korea's ultrapure water industry. Also, water treatment processes applied to this plant were developed by Korean companies. The presentation showed the current status of K-water in the ultrapure water industry and homework to solve to be a leader in the industry.

Dr. Suk Tae Kang (Professor of KAIST (Korea Advanced Institute of Science and Technology)) presented "*Occurrence and removal of urea during the wastewater reuse for ultra-pure water production*." Dr. Kang

introduced different water treatment technologies to remove urea, the most challenging contaminant in producing ultrapure water. His research team could remove about 50% urea with ceramic nanofiltration and reverse osmosis. His research team aims to achieve higher removal efficiency by developing technologies to remove urea. The last presenter was Dr. Jong Chan Yi (Senior Researcher of K-water). Dr. Yi presented "*Advanced analytics techniques for semiconductor industries ultrapure water*." He shared his own experience of advanced analytical techniques to measure ultrapure water quality. He introduced possible solutions to reduce ultrapure water sampling contamination and lower the water sample interference.

After five technical presentations, all presenters and the audience had a discussion session. Participants actively asked questions to the presenters, and presenters answered questions and shared their experiences on the ultrapure water project and trials and errors in producing ultrapure water. Dr. Kim and Dr. Jun suggested possible water treatment technologies for ultrapure water production. The forum was successfully finished, and it was an excellent opportunity to learn about ultrapure water and discuss the future pathway of the ultrapure water industry.

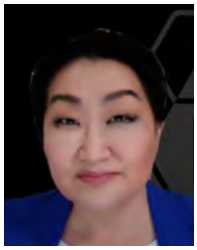
4. Group Photos

Yuhan Distinguished Forum

Cutting-Edge Research in Oncology

August 3 _ Thursday _ 1:30pm _ Fort Worth

Chair



Jayoung Kim

UCLA

1. About the Forum

Yuhan Corporation is a South Korea-based pharmaceutical company founded in 1926 by Dr. Il-han New, an independence activist, educator and innovative entrepreneur. Yuhan has achieved five out-licensing deals during the past five years, resulting in a total deal size of $3.54 billion. The topic of Yuhan Distingushed Forum is "*Cutting-Edge Research in Oncology*". This aimed to shed light on cutting-edge discoveries and innovative strategies against cancer.

2. Introduction and Welcoming Remarks

Welcoming Remarks was given by Mr. Taejin Yoon from Yuhan Corporation. Mr. Yoon shared the details on R&D efforts of Yuhan in his Keynote Talk. Prof. Kwon-Sik Park discussed the discovery of cancer vulnerabilities by synthesizing human and mouse model data. Prof. Serkin Park shed light on the biological mechanisms of cancer bone metastasis and present novel diagnosis and treatment strategies. Prof. Ju-Seog Lee discussed the identification of novel therapeutic targets and the development of targeting approaches, specifically focusing on antisense oligo drugs and metabolic inhibitors. And Seungwon Chung shared insights on the medicinal chemistry efforts in the pharmaceutical company. By bringing together researchers and experts in the field, this forum seeks to accelerate active discussions and collaborations with esteemed academic researchers.

3. Presentations

Following the welcome remarks and speaker introduction, Dr. Kwon Sik Park from University of Virginia, demonstrated how functional understanding of frequent mutations in small-cell lung cancer (SCLC) can lead to the discovery of molecular mechanisms of tumorigenesis and actionable targets. The title of his talk was " *Discovery of cancer vulnerability through synthesis of human and mouse data*". His talk focused on a recent study in which his group used an integrated approach to reveal a novel function of a specific p300 domain known as KIX. While p300 is frequently mutated in SCLC patient tumors, this domain is found to be retained in most of the mutant p300 proteins and played a crucial role in cell proliferation and survival. Dr. Park's research also demonstrated a proof-of-concept for disrupting the KIX-mediated protein-protein interactions for inhibition of tumor cell proliferation and shared an ongoing project aimed at developing small molecular inhibitors to target this domain. Dr. Park's research showcases the power of synthesizing human cancer genome data and mouse model data in a rational approach to tumor intervention.

Dr. Serkin Park's talk title was "*Osteoblast-lineage Cells as a Therapeutic Target for Breast Cancer Bone Metastasis: Regulation of Anti-tumoral Immunity via Brain-Bone Interactions*". Bone is a unique metastatic microenvironment because of complex interactions among numerous distinct cell types comprising the bone hard tissue and the marrow. Imbalanced bone homeostasis contributes to the progression of bone metastasis, yet the precise regulatory mechanisms remain unclear. In search for a major upstream factors of bone homeostasis and bone metastasis progression, we identified that chronic hyperactivity of the sympathetic nerve system (SNS) counterbalance anti-tumoral immunity in bone via upregulation of myeloid-derived suppressor cells (MDSC), immature myeloid-lineage cells with T cell-suppressive activity. This presentation will share the detailed data of the mechanism and discuss the potential implications in bone metastasis research and treatment.

Dr. Ju-Seong Lee's talk title was "*Decoding Cancer Genomes and Its Clinical Implication*".To address the convergence of genomic subtypes in liver cancer, which had been independently identified by multiple researchers, we amalgamated 16 previously recognized genomic subtypes. This

amalgamation revealed the existence of 5 consensus subtypes: STM (STeM), CIN (Chromosomal INstability), IMH (IMmune High), BCM (Beta-Catenin with significant Male predominance), and DLP (Differentiated and Low Proliferation). Additionally, we made a significant discovery regarding PEA15 as a new oncogenic driver within the STM subtype, followed by diverse functional validations. These five liver cancer subtypes exhibit strong associations with genomic traits and clinical outcomes. Moreover, they exhibit remarkable consistency across preclinical models. This consistency provides a foundational basis for the judicious selection of the most suitable models for preclinical investigations.

Dr. Seungwon Chung's talk title was "*Medicinal Chemistry effort in pharmaceutical company* ".Introduce drug discovery and development in the general process through fragment-based drug design focused on engaging the active site of IRAK4. It was leveraging three-dimensional topology in a ligand-efficient manner, a micromolar hit identified from a screen of a Pfizer fragment library was optimized to afford IRAK4 inhibitors with nanomolar potency in cellular assays. The medicinal chemistry effort featured the judicious placement of lipophilicity, informed by co-crystal structures with IRAK4 and optimization of ADME properties to deliver clinical candidate PF-06650833. This compound displays a 5-unit increase in lipophilic efficiency from the fragment hit, excellent kinase selectivity, and pharmacokinetic properties suitable for oral administration. Furthermore, it is the first iRAK4 targeted small molecules in the clinic and its current position is in Phase II.

4. Group Photos

KWiSE Distinguished Forum

KWiSE-WISET Women in STEM Forum in collaboration with KOFWST-KWSE

August 3 _ Thursday _1:00pm _ Developers

Chair

Mihyeon Jeon

Atkins

Co-Chairs

Aree Moon

WISET

Myongsook Oh

KOFWST

Seong Jin Ju

KWSE

1. About the Forum

Founded in 2004, KWiSE (Korean-American Women in Science and Engineering) is a non-profit organization to promote career development and networking of Korean-American women professionals in the science and engineering fields. Involving all key organizations working for Korean American women in the STEM field in both US and Korea, the main objective of this forum is to exchange ideas on career development, leadership, and empowerment of women in STEM and to discuss potential policies and strategies that are needed to expedite this process.

2. Introduction and Welcoming Remarks

Dr. Mihyeon Jeon, the President of KWiSE, welcomed all participants and introduced the co-chairs of the forum. She also highlighted the purpose of the forum and emphasized the importance of the current partnerships among US-Korea organizations for women in STEM. Dr. Aree Moon, the president of WISET, then stepped on to the podium to provide welcoming remarks, and she make a presentation on Women in STEM: The Best Bet to Solve the Talent Shortage. She presented on science and technology trends in digital transformation era, statistics on STEM workforce in Korea, and programs for women in STEM. As a special guest, Dr. Byung-Joo Min, the president of KIAT, provided a welcoming remark and presented on the key objectives and ongoing initiatives of KIAT.

3. Presentations

After an opening session by KWiSE and WISET, KWiSE-KWSE Session discussed the current and planned global collaborations in women in STEM and future directions. Speakers shared examples of various on-going successful global collaborations. Based on these examples, we discussed how women scientists and engineers could further strengthen existing collaboration and foster new collaborations. Below are the names of the presenters and their talk titles in this session.

- Dr. Seong Jin Ju (KWSE) – The International Cooperation Activities of the KWSE
- Dr. Young-Sil Kwak, KASI (KWSE) – Korea-US Cooperation in Space Science
- Dr. Jinah Park, KAIST (KWSE) – Global Collaborations in Women in STEM: Bringing MICCAI to Korea
- Dr. Minchul Song, ADD (KWSE) – Korea-US Defense S&T Cooperation

The KWiSE-KOFWST Session discussed future directions and vision of organizations working for women in STEM. Vision and path forward of the two organizations (KOFWST and KWiSE) were shared, then a panel discussion followed on how to empower women scientists and engineers. Below are the names of the presenters and their talk titles in this session.

- Dr. Hee-Kyung Ahn, The Sainsbury Laboratory – Thriving as Women in STEM: Stronger Together
- Dr. Sungsil Moon, CDC (KWiSE) – Successful Story of Collaboration
- Dr. Myongsook Oh, (KOFWST) – 20 Years of Leadership and Future Vision of KOFWST
- Dr. Mihyeon Jeon, Atkins (KWiSE) – What's Ahead for KWiSE: Vision and Path Forward in the Age of Digital Transformation and AI
- Dr. Oh Nam Kwon, Seoul National University (KOFWST) – Fostering DE & I and Allyship
- Dr. Ran Baik, Honam University (KOFWST) – Leadership & Future Vision of Women in STEM

Dr. Oh Nam Kwon of Seoul National University (KOFWST) was not able to participate in person, but the audience watched the video titled as “Fostering DE & I and Allyship” that Dr. Oh pre-recorded for this forum. After all the presentations, we had a panel discussion to further communicate on our vision and goals to empower women in STEM and the importance of global collaboration. The panelists involved included Dr. Ran Baik, Honam University (KOFWST), Dr. Eun-Suk Seo, University of Maryland (KWiSE), and Dr. Bo Young Park, California State University Fullerton (KWiSE).

This forum was designed to be an interactive and engaging event to foster networking and mentoring among the attendees. The forum provided an excellent opportunity for the participants to learn from the women leaders in the STEM fields and get inspired to become a future leader in STEM.

4. Group Photos

Sponsor Forum Report

KBSI Sponsor Forum

Multipurpose Synchrotron Radiation (4GSR):
Current States and Future Prospects at the Korea Basic Science Institute (KBSI)

August 4 _ Friday _ 1:30pm _ Room Vandergriff

Chair

Young-Kee Kim

University of Chicago

Co-Chairs

Sung Kwang Yang

President
KBSI

Hyoung Joong Yun

KBSI

1. About the Forum

To promote the collaborative development and utilization of the synchrotron facility, we would like to introduce the recent progress of the new multipurpose synchrotron (4GSR) project and x-ray science programs in Korea. We also invite speakers of accelerator and x-ray science in US society to find a way for future collaboration.

2. Introduction and Welcoming Remarks

Dr. Hyung Joong Yun (Co-Chair, KBSI) gave welcoming remarks at the beginning and Prof. Young Kee Kim (Chair, Univ.Chicago) introduced two speakers from the U.S. and two speakers form Korea.

As a welcome remark, Dr. Sung Kwang Yang who is a president of KBSI introduced that the construction and operation of national large-scale research infrastructure, providing comprehensive research support of KBSI. His presentation was also focused on the leading the global analytical science research based on state-of-the-art large-scale research facilities and equipment.

3. Presentations

Prof. Jae Hun Yu from Univ. of Texas at Arlington's talk title was "*Use of accelerator in understanding neutrino properties and discovering dark matter in the beams*". Here is the abstract of this talk. Accelerators are essential in pursuit of understanding the origin of the universe and mass. In these measurements, accelerators also provide precision calibrations from secondary charged particle production 5. Accelerator facilities act not only for the tools for fundamental sciences but also an excellent training ground for the next generation scientists for Korea to become a leader in accelerator based science.

Dr. Jae Hun Park from Pohang Accelerator Laboratory's talk title was "*Current Status and New Challenges of PAL*". Since the completion of PLS construction in 1994, Pohang Accelerator Laboratory has grown until it become one of the global top 5 facilities which operate 3rd generation synchrotron and X-ray FEL. We are now moving towards new challenges for continuous growth. In this talk, I will discuss the current status and the new challenges of PAL.

Dr. Kyung Tae Ko from Korea Basic Science Institute's talk title was "*Introduction to New Multipurpose Synchrotron (4GSR) Project in Korea*". Recently, new synchrotron project has begun in Korea. To respond the growing research requirements in basic science as well as industrial developments, a 4th generation synchrotron is going to be constructed in Ochang, central region of Korea. In this talk, I would like to introduce historical backgrounds of the new synchrotron project and to display brief synchrotron specifications and plans of 1st stage beamlines. Finally, I wish to discuss scientific significance of this project for the advanced photon science in Korea.

Dr. Won Suk Cha from Argonne National Laboratory's talk title was "*Nanoscale Imaging at Next Generation Synchrotron Sources*". The coherent flux from the next generation synchrotron sources will enable a revolution in Bragg Coherent Diffraction Imaging (BCDI), a powerful tool for high-resolution nanoscale imaging. At the Advanced Photon Source (APS), BCDI currently enables three-dimensional imaging at tens of nanometer and tens of minute of spatial and temporal resolution, respectively. In the near future, one anticipates atomic resolution imaging or three-dimensional imaging at just seconds of temporal resolution. In this talk, I will discuss the current state-of-the-art of BCDI showing recent experimental results and present future plans for BCDI at the next generation synchrotron sources.

4. Group Photo

KHIDI Sponsor Forum

Career Development through Research Opportunities in US

August 4 _ Friday _ 1:30pm _ Room Fort Worth

Chair

Soondo Cha

President of KHIDI

Co-Chair

Youngmi Ji

NIH

1. About the Forum

This forum sponsored by Korea Health Industry Development Institute (KHIDI) aims to provide a platform for Korean researchers who wish to gain training experience in the US where researchers with training experience in the US can share their experiences and opportunities. The purpose is to gather opinions presented in this forum and incorporate them into future implementation of the personnel exchange program conducted by KHIDI.

2. Introduction and Welcoming Remarks

Forum conducted as 1) Welcoming remarks and KHIDI introduction. (Soondo Cha, KHDI), 2) Introduction to KHIDI and KVSTA program. (Sanghun Shin, KHIDI), 3) Introduction to research Opportunities at NIH. (Hoi Sung Chung, NIH), 4) post-doc experience sharing – I. (Jun-Ho La, UTMB), 5) post-doc experience sharing – II. (Young-Sup Yoon, Emory University), and 6) Q &A with all speakers. (Youngmi Ji, NIH).

3. Presentations

After welcoming remarks by President. Cha, he expressed in the introduction how this session might benefit to young researchers including early-career medical researchers thorough sharing personalizing "*KNOW-HOW* ("나만 아는 꿀팁")from valuable and experienced senior peers in a particular field of research for public health. Director Shin Sang-hoon introduced KHIDI's main structures and projects including ESG management and announced two major annual events including Korea-Bio and Medical-Korea as well as newly lunched program "*KVSTA*" at National institutes of Health (NIH), USA. He also discussed the points of improvements for those programs. Our first speaker, Dr. Chung from NIH introduced the NIH structure and overview of Budgets, apply post-doc training at NIH after his PhD from MIT, his tips to find the PI through the network for his career and research goal as first part of his talk and shared his past PhD and post-doc research and current research from two-color FRET to single color FRET for single-molecule spectroscopy and fluorescence imaging as his second part of talk. Professor La Junho shared a story that was akin to as a book recounting his career, capturing the audience's attention. He highlighted the analogy of the challenges faced on a long voyage at sea, drawing parallels to the difficulties in our careers. Despite the hardships encountered during the journey, it was emphasized that every decision made at those moments helped steer us toward the path we truly desire, much like navigating through the rough waters to find our way. He also emphasized the significance of grants in our career development. Lastly, our speaker Professor Yoon Young-seob was a distinguished cardiologist and scientist who had a unique career path.

He didn't hold back on sharing valuable advice, and among his unique tips were: 1) Listen to others. It helps in formulating strategies, 2) Be proactive in your approach, 3) Understand the different emotions/culture in USA, 4) Emphasize both persistence/maintain and soft skills, etc.

Attended audience were varies (i.e., Student, Post-doc, Faculty from university, Industry and Government Professional officer etc), from different level of careers (from undergraduate student to retired profession). There were many questions and intensive discussion with audience during these presentation or Q&A after.

During the main presentation and afterwards, he received numerous questions from the audience. Most of these questions related to visa issues in the USA and how diversity of job opportunities after

training in the USA with the corresponding solutions to visa challenges. Professors from various universities also engaged in in-depth discussions about grant application methods and tips to success and the challenges they are facing currently, such as the decreasing applicant for postdocs or graduate students due to decreasing population in general and changing the thinking culture in young generation. Moderator, Youngmi Ji (from NIH) were asking to all speaks for one final tips to success their career development in the USA. Finally, moderator, Youngmi Ji (from NIH) concluded the session by asking final question to all the speakers. Q: If you were to go back to the time when you were contemplating your careers, what would your one of valuable one tip (꿀팁) be for building a successful career? A: Set the goal for project and career, more proactive, and make your network (mentoring).

This session wasn't just a one-way knowledge transfer; rather, it was an atmosphere of mutual encouragement, where speakers shared their experiences and resonated with the audience. Through this session, many attendees expressed that they gained a better understanding of the new structure of the NIH and various careers with visas they hadn't been aware of before. The speakers, who humbly shared their own experiences during this session, displayed their effort to impart their personal insights and tips, no matter how small. It was a session where both speakers and the audience came together, resulting in fruitful outcomes. We all appreciate this success and looking forward to seeing again, next year.

4. Group Photos

KICT Sponsor Forum

AI-based Innovative Technology for Advanced Urban Infrastructure Management:
Focusing on Autonomous Driving and Flash Flood

August 4 _ Friday _ 1:30pm _ Room Lone Star I

Chair

Seung-Ki Ryu

Director
KICT

Co-Chair

Sung-Hee (Sonny) Kim

University of Georgia

1. About the Forum

Sustainable City' is an ongoing hot topic for many cities in the world as a future to overcome the diverse issues caused by excessive population growth and rapid urbanization. This KICT forum will foster discussion about SOC infrastructure management for Sustainable City by presenting studies and projects from the U.S. and Korea.

2. Introduction and Welcoming Remarks

Dr. Seung-Ki Ryu (Director of KICT) gave welcoming remarks. Following the welcome remarks and speaker introduction, Dr. Kang-Suk Kim (Head of Research Policy Division at KICT) presented KICT's research activities. Then, Dr. Jaehong Park gave a presentation introduced the Strategy of Future Road Design for Cooperative Automated Vehicle. This presentation suggested the infrastructure demands of Autonomous Vehicles (AVs), an area of growing interest globally.

3. Presentations

As AVs' prevalence increases, people can foresee drastic shifts in driver behavior, vehicle ownership, and travel demand trends, necessitating changes in traffic management and road design. To address these evolving needs, Dr. Park proposed a new road design, advocating for significant modifications in our current road infrastructure and urban spaces. Dr. Adam Kasliszewks (Project Delivery Director at CAVNUE) also presented on the future roads with a similar topic. Dr. Hyung-Jun Kim (Senior Researcher at KICT) presented "Development of AI Flood Analysis and Forecasting Method based on Intelligent Information Technology": In order to mitigate flood damage in urban areas, it is important to not only enhance the capacity of existing infrastructure but also establish a system that can accurately predict the extent of flooding resulting from rainfall exceeding design limits. To achieve advanced urban flood countermeasures, a new technique is currently being developed. This technique consists of four key components: 1) high-precision analysis of urban flood dynamics, 2) improved analysis efficiency through the application of artificial intelligence, 3) a simplified physical model for urban flood forecasting, and 4) a Meta Solution for Urban Flood Management. Through this research, it is anticipated that urban flood mitigation technology will reach new heights.

Dr. Jeong Jaehak (Professor at Texas A&M University) introduced "*Hydrologic Assessment of Urban Green Infrastructure*". Urbanization often leads to flooding, soil loss, and water quality issues due to flashy stormwater runoff and increased aquatic contaminant concentration. The Soil and Water Assessment Tool (SWAT) was enhanced for hydrologic assessment of urbanization and green infrastructure implementation in urban catchments. In a case study in Austin, Texas, rain gardens showed the highest runoff reduction rate (77%) when fully implemented, followed by porous pavement (29%) and green roofs and cisterns at the lowest reduction rate (15%). In addition, widespread implementation of green infrastructure could reduce the 2-year peak runoff rate by approximately 24%.

Dr. Dong Sop Rhee (Research Fellow at KICT) presented "D*evelopment of Technology to Reduce Urban Flood Damage through Simulated Inundation on the Environmental Facility*". This study aims to analyze the risk of flooding for environmental facilities based on the rainfall intensity and analysis results for each scenario according to the progress of flooding by considering the arrangement of water treatment process. Because environmental facilities are not standardized in their layout, and the size and placement of facilities vary depending on the treatment process. In conjunction with the simulation results and the treatment process, inundation risk index based on facility structural characteristics is derived to predict the risk of inundation damage considering the risk classification.

After six technical presentations, all presenters and the audience had a discussion session. Participants actively asked questions to the presenters, and presenters answered questions and shared their experiences. The forum was successfully completed by exchanging potential collaboration topics and opportunities.

Dr. Yang Ki Hong (Professor of the University of Alabama) presented on the design of magnetic materials and permanent magnet synchronous motors for electric vehicles.

3. Group Photos

KISTEP Sponsor Forum

R&D Directions and Policies for Dual-Use Technology

August 4 _ Friday _ 1:30pm _ Room Dallas

Chair

Byung-Seon Jeong

KISTEP

Co-Chair

Tom Oh

Rochester Institute of Technology

1. About the Forum

KISTEP Forum on "*R&D Directions and Policies for Dual-Use Technology*" will seek efficient application and linkage of dual-use technology between civil and defense science and technology, including commercialization. The forum will find ways to promote cooperation between the Republic of Korea and the United States to learn and merge directions and policies through comparison and analysis.

The forum had four speakers who shared their perspectives on dual-use technology, and their talks were valuable to apply and implement it. Here is the schedule and summary of each speaker.

Time	Title and Speaker
1:30 - 1:35 pm	**Welcome Remarks** // Young Chang Joo, Vice Minister for S&T and Innovation, MSIT
1:35 - 1:45 pm	**Welcome Remarks / Introduction to KISTEP** // Byung-Seon Jeong, KISTEP
1:45 - 2:10 pm	**The importance of effectively applying and linking dual-use technologies** // Seung-Hyuk Lim, KISTEP
2:10 - 2:35 pm	**Navigating the Nexus of Data Protection and Information Sharing in Government Cybersecurity** // Kyung-Shick Choi, Boston University
2:35 - 3:00 pm	**Overview of US NAVY SBIR/STTR programs** // Brian Shipley, US Navy
3:00 - 3:25 pm	**S. Korea-US cooperation on Defense R&D** // Lae Hyunk Kim, KIST
3:25 - 3:30 pm	**Closing Remarks and Photo** // All participants

2. Introduction and Welcoming Remarks

Dr. Byung Seon Jeong gave welcoming remarks at the beginning. Dr. Jeong introduced two speakers from Korea and Dr. Tae Oh (Forum Co-Chair) introduced two speakers the US.

3. Presentations

Dr. Byung Seon Jeong introduced the history and roles of KISTEP. KISTEP was founded in 1999 due to Article 20 of the Framework Act on S&T. KISTE is the only STI Think Tank in Korea engaged in all the aspects of national S&T policy planning R&D budget allocation. Dr Jeong discussed the overview of S&T policy planning, technology foresight, budget allocation, and preliminary feasibility studies on government R&D programs.

Dr. Seung Hyuk Lim presented "*The Importance of Effective Applying and Linking Dual-Use Technologies*." He shared Science and Technology Warfare, critical & emerging technology, and the concepts of dual-use technology. An interesting trend was spin-on application, which uses civilian technology for the defense sector. Another interesting information was the dual use technology program in Korea. Spin-on effort from US and Korea is shared. In summary, dual-use technologies are important for national defense, and modernized governance and improved acquisition management systems are required to execute properly.

Dr. Kyung Shick Choi from Boston University presented "*Navigating the Nexus of Data Protection and Information Sharing in Government Cybersecurity*." He presented a threat of data loss from insiders. This is becoming a serious problem. Security and Exchange Commission (SEC) has proposed a new set of cybersecurity disclosure rules for public companies that would require them to report "material cybersecurity incidents" to the SEC within four days. He also shared conditions and restrictions for handling sensitive information. He touched on personal data de-identification, data transfer, secure data management, and protecting data from security breaches, and handling data after research for government data /human subjects' data restrictions.

Mr. Brian Shipley, Navy SBIR/STTR Commercialization Program Manager, presented "*Navy SBIR/STTR Implementation*". He presented the concept and goals of SBIR/STTR as well as the different phases of the programs. The program process was presented and those were identifying needs, soliciting proposals, evaluating proposals, award contracts, government project lead responsibilities, assistance to awardees, and benefits of the program.

Dr. Laehyun Kim, Head for the Center for National Defense Technology Strategy, presented "*South Korea-US Cooperation of Defense R&D*." He started presenting rising geopolitical risk and tech cooperation reshaping ROK-US relations. Also, the ROK-US S&T organization and International R&D programs in Korea are explained. Dr. Kim recommends promoting civil-military cooperation, new DoD research labs and the Center for National Defense Technology Strategy (CNDTS), and defense industry cooperation. Lastly, bilateral cooperation in defense of S&T will strengthen the ROK-US alliance and deter threats from potential adversaries.

KITECH Sponsor Forum

Forum on Rare Metals: Eco-Friendly Processing Technology and Applications

August 4 _ Friday _ 1:30pm _ Room Houston

Chair

Kwang Jin Lee

Director of
KITECH USA

Co-Chair

Yang-Ki Hong

University of
Alabama

1. About the Forum

The global demand for rare metals, elements with high industrial demand but difficult to extract, is growing as the industry for electric vehicles, secondary batteries, and wind/solar energy is developing. In spite of the growing demand, rare metals are reserved and produced only by few countries, which indicates that the understanding of rare metals should be done in the political and diplomatic context. KITECH forum on rare metals focuses on analyzing the current state of the rare metal industry in South Korea and highlights the role of the Korea Institute for Rare Metals (KIRAM) of KITECH. The speakers also discusses the strategies for enhancing the competitiveness of the rare metal industry in South Korea, and ways to stabilize the supply chain in the global value chain environment.

2. Introduction and Welcoming Remarks

Dr. Kwang Jin Lee (Director of KITECH USA) gave welcoming remarks at the beginning and introduced KITECH to the audience. Dr. Yang Ki Hong (Professor of the University of Alabama) introduced two speakers from the South Korea and one speaker from the U.S.

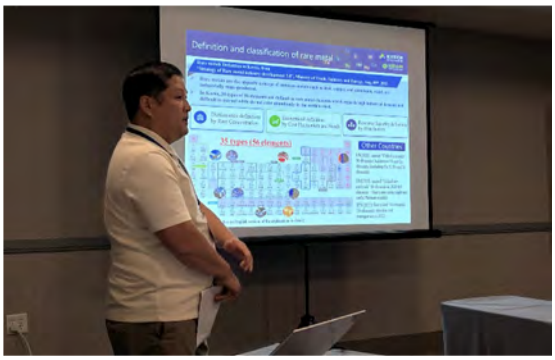
3. Presentations

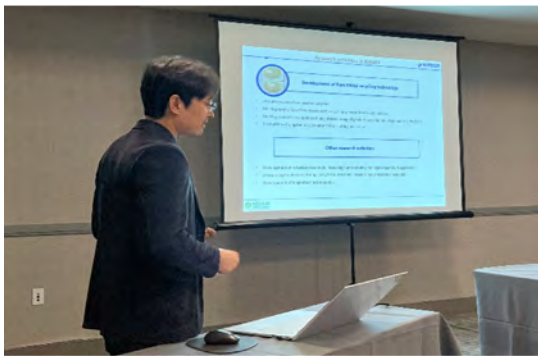
Dr. Kyoung-Tae Park (Director of KIRAM, KITECH) explains about the state of affairs in the rare metal industry. As the rare metal industry is suffering from national trading conflicts and reduced production due to COVID-19, Dr. Park emphasizes the importance of establishing policy goals to develop the industry. He suggests three policy goals: nurturing core companies, establishing stable rare metals supply chain, and securing resources. He also gives a brief overview of the current status of the rare metal industry in Korea regarding rare earth, refractory and high active metals, and energy material.
Dr. Jun Hee Han (Principal researcher of KIRAM, KITECH) focuses on the role of KIRAM in rare metals. He explains KIRAM is a sub-organization of KITECH designed to establish the infrastructure for rare metals industry of South Korea. KIRAM is actively continuing its R&D activities such as developing melting & refining technology of high-purity refractory rare metals, and analyzing alloy materials. Not only limited to R&D activities, KIRAM puts effort in developing R&D infrastructure and standardization of rare metals industry to support SMEs.

Dr. Lee Seung Kang (Senior researcher of KIRAM, KITECH) explains about the current utilization of Titanium, and behaviors of microstructure for cp-Ti during rolling process. Dr. Kang starts the presentation by introducing basic concepts of titanium and manufacturing process of the production. He then elaborates on experimental procedures, leading to meaningful results. He concluded that microstructural studies revealed DRXed grains were CDRX among several types of DRX. Also, DRX affected the formation of texture of cp-Ti, and the weakest texture was formed in RR with most DRXed grains.

Dr. Yang Ki Hong (Professor of the University of Alabama) presented on the design of magnetic materials and permanent magnet synchronous motors for electric vehicles.

4. Group Photos





Seoul National University (SNU) Sponsor Forum

Forum on Transformative Actions: Pioneering the Future

August 4 _ Friday _ 1:30pm _ Room Austin

Chair

Jae Young Kim

Executive Vice President for Research Affairs
Seoul National University

Co-Chair

Jaejun Yu

Dean
College of Natural Sciences
Seoul National University

1. About the Forum

This forum aims to shed light on the diverse initiatives instrumental in shaping SNU's transformative actions. From groundbreaking research projects and interdisciplinary collaborations to community engagement and sustainability efforts, SNU has left an indelible mark on society.

This forum provides an open and inclusive space for meaningful conversations. Together, let us explore the diverse facets of SNU's transformative actions and their profound impact on the future.

2. Introduction and Welcoming Remarks

Prof. Jae Young Kim gave welcoming remarks at the beginning, introducing the invited speakers: four speakers from Seoul National University.

3. Presentations

Prof. Jaejun Yu (Dean of the College of Natural Sciences, SNU) introduced SNU College of Natural Sciences. He introduced CNS departments and interdisciplinary programs (Genetic engineering, Neuroscience, Bioinformatics, Computational Science & Technology). He presented scientific research exemplars: (1) Functional viremic screens uncover regulatory RNA elements (Prof.V.Narry Kim) (2) Modulating target proteins via the ubiquitin-proteasome system (Prof. Seung Bum Park) (3) Embedding metal-halide perovskite particles within and insulating host matrix for designing highly luminescent Cs-Pb-Br perovskites (Prof. Tak Hee Lee) (4) Millisecond neural activation tracking (Prof. Jeehyun Kwag) and there are more scientific innovations and discoveries in the field and many professors and scientists are participating in large-scale research projects.

Prof. Jaejin Lee (Dean of the Graduate School of Data Science, SNU) introduced the Graduate School of Data Science. He presented ABCDE of Data Science: AI, Big Data, Computing, Domain Knowledge, and Entrepreneurship. He also introduced the number of admissions, faculty members, core courses, etc. He emphasized the identity of the GSDS and the role of the Leading Engineering Research Center, which opened in June 2023.

Prof. Junseok Hwang (Director of Global R&DB Center, SNU) represented Global Vision for Smart City and Future Education. He introduced Smart Entrepreneurship Innovation and Future Education in Smart Campus, Siheung, and Neocity. He introduced Siheung and explained annual plans for hyper-data smart city Siheung and business models and scenarios for the model projects. He presented the second SNU Smart Campus, Neocity, and explained the vision, missions, capacity resources, and environment.

Prof. Junsuk Kang (Director of the Specialized Graduate School of Intelligent Eco-Science, SNU) introduced the Specialized Graduate School of Intelligent Eco-Science (GS-IES); first, he presented GS-IES' vision, participation, workforce, etc. Second, he gave the concept of intelligent Eco-Science. He also presented urban flooding adaptation using Eco-Science with a Hazard Capacity Factor Design (HCFD) Model. Lastly, he introduced intelligent Eco-Science technologies and research achievements.

4. Panel Discussion

Following the four presentations, forum participants engaged in a 15-minute open discussion concerning the importance of SNU's transformative actions for pioneering the future. This forum provided an excellent platform for active dialogue between researchers from the U.S. and Korea.

5. Group Photo

UNIST Sponsor Forum Report

The Path to Carbon Neutrality: Electrification, Decarbonization, and CO_2 Capture

August 4 _ Friday _1:30pm _ Room Hobby

Chair

Tae-Hyuk Kwon

Dean of College of Natural Science
UNIST

Co-Chair

Jungki Ryu

Associate Professor
UNIST

1. About the Forum

This symposium brings together leading experts to explore innovative approaches for achieving carbon neutrality. Topics include efficient perovskite solar cells, cutting-edge CO2 capture technologies, electrochemical synthesis of chemicals, production of sustainable fuels from biomass, and synthetic biology for plastics upcycling. Participants will engage in discussions and presentations highlighting breakthrough research and advancements in these areas. The symposium aims to accelerate the global transition towards a sustainable and carbon-neutral future by fostering collaboration and knowledge exchange. By delving into these diverse fields, attendees will uncover transformative solutions, paving the way for renewable energy, effective carbon capture, sustainable chemical production, biomass utilization, and waste upcycling. Together, they strive to create a cleaner and greener world for generations to come.

2. Introduction and Welcoming Remarks

Prof. Tae-Hyuk Kwon gave welcoming remarks at the beginning, introducing the invited speakers: three speakers from Korea and two speakers from the U.S.

3. Presentations

Prof. Dong Suk Kim (Professor in the UNIST Graduate School of Carbon Neutrality) discussed recent research trends in perovskite solar cells (PSCs), which are considered the next-generation solar cells that can compete with silicon solar cells. He highlighted two major research directions: (1) pushing the efficiency of PSCs to their theoretical limit and (2) enhancing their stability for practical applications.

Prof. Jungki Ryu (Associate Professor in the UNIST School of Energy and Chemical Engineering) presented on the systematic approaches to electrochemical synthesis. He emphasized the importance of reducing energy consumption for practical application of electrolysis. He introduced recent efforts, such as (1) the utilization of inexpensive and energy-efficient electron sources and (2) controlling electrode wettability to manage gas bubbles in electrolyzers.

Prof. Sunkyu Park (Professor in the NCSU Department of Forest Biomaterials) introduced studies focused on producing fuels and chemicals using biomass, particularly waste streams from pulp and paper industries, from engineering and practical perspectives. He emphasized the significance of technoeconomic analysis in early-stage studies to address urgent carbon neutrality issues.

Prof. Tae Seok Moon (Associate Professor in the WUSL Department of Energy, Environment & Chemical Engineering) presented his recent achievements regarding utilizing and engineering microbes for biologically degrading and upcycling waste plastics, particularly polyethylene terephthalate (PET).

Prof. Wonyoung Choe (Professor in the UNIST Department of Chemistry) introduced various types of porous materials, with a specific focus on metal-organic materials for gas storage and separation. He particularly highlighted AI-assisted tailored molecular design of porous materials for CO2 capture.

4. Penal Discussion

Following the five presentations, forum participants engaged in a 15-minute open discussion concerning the importance of interdisciplinary studies in electrification, decarbonization, and CCUS (CO2 capture, utilization, and storage). This forum provided an excellent platform for active discussion and collaboration between researchers from the U.S. and Korea.

5. Group Photo

KSEA Forum Report

KSEA Science Policy Forum (closed session, invited only)

August 3 _ Thursday _ 10:30am _ Room Austin

Chair

Seunghwan Kim

POSTECH

Moderator

Jaehoon Yu

University of Texas, Arlington

The Science Policy Forum (SPF) will bring together key scientists and law makers in the U.S. and Korea to strengthen their network and collaboration on science and technology policy. In particular, scientists and policy makers can share ideas and best strategies for cooperation on frontier technologies of mutual interests and emerging technologies in the era of global technology supremacy. Policies of bilateral cooperation on science and technology can be discussed such that they could further enhance stronger global collaboration between scientists and policy makers between Korea and the United States.

Time	Title and Speaker
10:30 - 10:40 am	**Welcoming Remarks** // Presidents of KSEA & KOFST
10:40 - 10:50 am	**Theme Introduction** // Jaehoon Yu (University Texas, Arlington)
10:50 - 11:10 am	**U.S. Space Technology and policy** // Eunsuk Seo (University of Maryland)
11:10 - 11:30 am	***TBD** // Korean Leaders in Science & Technology
11:30 - 12:20 pm	**Speeches and Moderated Free Form Discussions** // Invited Participants
12:20 - 12:30 pm	**Concluding Remarks and Photo**

*To be confirmed

KSEA Science Diplomacy Forum

August 3 _ Thursday _ 1:30pm _ Room Austin

Chair

Jaehoon Yu

University of Texas, Arlington

Moderator

Seunghwan Kim

POSTECH

Recently, a compounded wave of global crises involving technology war and security has been affecting the scientific community as well as our society, countries, and world at all levels. As we are heading into more complex, uncertain, and conflict-prone future, it calls for proactive involvements and viable contributions from a global network of science and technology communities in addressing global challenges to our common future.

In this session, we discuss some of the key lessons learned from our experience on global agenda involving science and technology and share our thoughts on the newly found impact and the role of a global cooperation by scientific communities for a sustainable future for all. We discuss how a diverse non-government and government actors can and should work together on science and diplomacy to navigate the complexities of current and future global challenges to human survival and prosperity.

In particular, the Science Diplomacy Forum will serve as a town meeting platform for strengthening science and technology collaboration between South Korea and the United States with partners around the world and exploring the role of scientific organizations and institutions, for example, KSEA and KOFST, in promoting dialogues and bridging the growing networks between scientific and diplomatic communities to better cope with common challenges together.

Time	Title and Speaker
1:30 - 1:40 pm	**Welcoming Remarks** // Presidents of KSEA & KOFST
1:40 - 1:50 pm	**Theme Introduction** // Seunghwan Kim (POSTECH)
1:50 - 2:10 pm	**Keynote Presentation** // Eunsuk Seo (University of Maryland)
2:10 - 2:35 pm	**Presentations** // Sung-Kwang Yang (Korea Basic Science Institute, KBSI), Jeongwook Eom (KOFST)
2:35 - 3:25 pm	**Open Discussions** // Jinwon Kang(KISTEP), KSEA leaders* + CEO Myonghoon Chong*
3:25 - 3:30 pm	**Concluding Remarks and Photo**

*To be confirmed

KSEA R&D Leadership Forum

Roundtable Discussion on R&D Culture and Collaboration

August 3 _ Thursday _ 4:00pm _ Room Developers

Chair

Tae (Tom) Oh

Professor
Rochester Institute of Technology

Presenters

Rebecca Lynn Spyke Keiser

Chief of Research Security Strategy and Policy
National Science Foundation

Jeremy Epstein

Program Director
Secure and Trustworthy Cyberspace (SaTC) Lead
Division of Computer and Network Systems (CISE/CNS)
National Science Foundation (NSF)

1. About the Forum

Research institutes operated for/by government and private sectors have well-defined and focused missions for technological development and/or scientific knowledge that rely on strong foundational expertise, culture, and capability. Increasingly complex and interdisciplinary requirements for substantial and meaningful outcomes warrant an expansive network of R&D expertise, inclusive activities, and efficient administration. This roundtable discussion will examine the mission, capability, and accomplishment of various research institutes, explore the potential roles of complimentary resources to enhance the mission-critical and mission-supporting R&D activities, and discuss cultural understanding and potential mechanisms needed to further promote US-Korea interactions in R&D.

2. Introduction and Welcoming Remarks

The forum started with an introduction by each R&D leader. Each leader shared their institute's mission, culture, and accomplishments. Jeremy Epstein and Rebeccas Keiser from NSF were very interested in the different missions of the institutes. There were interesting questions from the NSF directorates, especially the institutes' policies, processes, and responsibilities.

3. Presentations

After the introduction, Jeremy Epstein presented the mission and responsibilities of NSF. Also, Rebecca Keiser talked about international collaboration opportunities, including the process, requirements, opportunities and challenges.

The roundtable discussion occurred between NSF directorates and institute leaders. The discussed items are shown in the bullets.

- International collaboration possibilities with NSF and research institutes. An example of India and NSF was discussed. How was the collaboration possible? What opportunities exist? Is it possible to use the NSF-India model for collaboration with Korea?
- Handling of intellectual patents
- Different types of international collaborations.

R&D Leaders from Korea

Young Dae Ryu

General Director
KUSCO / NRF

Soondo Cha

President
KHIDI

Byung-Seon Jeong

President
KISTEP

Sanghoon Lee

Director
KFRI

Joonyeon Chang

Director-General
KIST

Sung Kwang Yang

President
KBSI

Byung Joo Min

President
KIAT

Jaehyung Kim

CTOof Hanwha
Solutions

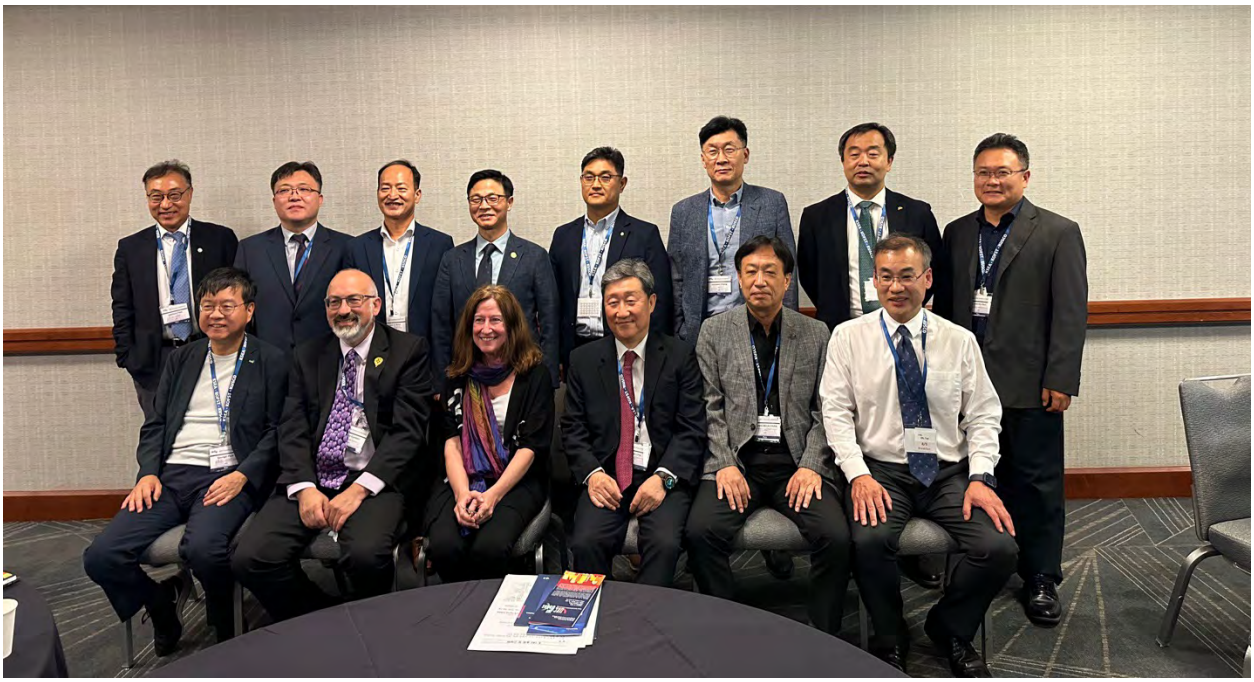
Young-Deuk Park

President
KASI

Seungki Park

President
KAIA

4. Group Photo



KSEA University Leadership Forum

August 3 _ Thursday _ 4:00pm _ Room Wetzel

Chair

김영기

University of Chicago

Co-Chair

정병선

한국과학기술기획평가원 원장

1. About the Forum

Local cities in Korea are having a hard time due to population decline and concentration in the Seoul area. Local issues do not simply end as local issues, but they are issues of Seoul and of Korea as a whole. Korea is currently aiming to foster regionally specialized projects as one of the measures for local issues. Some answers to these issues can be found in globalization to the problem of regional research human-power and the disappearance of the region. Via candid conversations, the panelists and the audience of the forum shared their experiences through various existing and future programs in Korea, ideas to reduce the local city issues, and challenges associated with the programs and ideas.

2. Introduction and Welcoming Remarks

Young-Kee Kim, Former KSEA President and Byung-Seon Jeong, President, Korea Institute of S&T Evaluation and Planning gave welcoming remarks at the beginning.

3. Presentations

The forum was organized in two parts.

Part I: Korea is currently aiming to foster regionally specialized projects as one of the measures for local issues. The first part of the forum focused on how local governments, universities, government-funded research institutes, and companies can create a healthy ecosystem that can create synergies with each other. This session was moderated by Soon-Ki Kwon, President of Gyeongsang National University. The panel members include Won-hwa Hong, President of Kyungpook National University, Yonghoon Lee, President of UNIST, and Jae Gwan Kim, Dean of International and Public Affairs at GIST.

Part II: Some answers to the local city issues can be found in globalization to the problem of regional research human-power and the disappearance of the region. The second part of the forum focused on questions such as what strategies are needed for cities, universities, research institutes, and companies in pursuit of globalization?; and how will the relationship between cities and universities develop from the perspective of globalization? This session was moderated by Jaeho Yeom, President of Taejae University. The panel members include Jae Young Kim, Executive Vice President for Research Affairs at Seoul National University, Kee-choo Choi, President of Ajou University, Yunkeum Chang, President of Sookmyung Women's University, and Lee Ki-jeong, President of Hanyang University.

After each session, the forum participants had open discussions with the panelists.

4. Group Photo

KSEA History Committee Forum Report

Reflection of KSEA History in 120 Years of Korean Immigration to the United States

August 5 _ Saturday _ 8:00am _ Developers

Chair

Chueng-Ryong Ji

North Carolina
State University

Co-Chair

Soolyeon Cho

North Carolina
State University

1. About the Forum

The UKC 2023 KSEA History Committee (HC) Forum was held in person reflecting the KSEA History in 120 Years of Korean Immigration to the United States. Total 12 presentations were given in the forum with the following program.

Time	Title and Speaker
8:00 - 8:15 am	**Welcoming Remarks and Group Photo** // Yongho Sohn, KSEA President and all participants
8:15 - 9:30 am	**Forebears of Korean Immigration** // Chueng-Ryong Ji
	Early History of Korean Students in US // Kang-Wook Lee
	What is history? // Sung-Kwon Kang
	Early Years of KSEA // Chan-Mo Park
	Academic Contributions // K. Wayne Lee
	Entrepreneurship Development, KSEA Demography // Myung Jong Lee
	Demography of Women Scientists and Engineers // Eun-Suk Seo
	ESTEEM Video Project and the 120 Years Anniversary Book // Jahae Yun
	Video Remarks from the family of the Late Professor Shoon Kyung Kim // Matt Kim and Mrs. Jeung Hi Kim
	Video Presentation of Young Generation Perspectives // Jonathan Kim and YGs
9:30 - 9:55 am	**KSEA and Collaboration Opportunities with Korean Societies including Korean American Association and Community Center (KAACC)** // Casey Youn (KAACCH President), Sam Sangsoo Ryu (ExxonMobil Shipyard Program Manager)
9:55 - 10:00 am	**Concluding Remarks** // Chueng-Ryong Ji and Soolyeon Cho

2. Key Messages

- Shared the rich, proud and heartfelt early history of Korean immigration, Korean students and KSEA
- Pondered noble purpose and vision of 홍익인간, 홍익 Korea & U.S
- Discussed how the nonprofit Korean-American voluntary organizations such as KAACCH, KOEA and KSEA may collaboratively serve the Korean-American communities together.
- The influence from the historical background appears indispensable in understanding the first generation of Korean-American, in particular, the inherited volunteerism that manifested in founding the KSEA a half century ago.
- We hope that this forum propagates this spirit of volunteerism to the younger generation and more joint activities between the younger generation and the elder generation can be fostered in the near future.

3. Critical Challenges Experienced

- Participation of the younger generation was too limited with the arrangement of the KSEA Forum simultaneously with the your generation program FIRE.

4. Group Photos

Scholarship Winners

2023 KSEA - KUSCO Graduate Scholarship Winners

Bo Ra Kim
University of Texas at Austin

Chunghwan Kim
Arizona State University

David Ha Eun Kang
MIT

Woojung Lee
Columbia University

Jaehoan Kim
Texas A&M University

Ji-young Lee
Touro College of Pharmacy

Jinwon Oh
Stanford University

Kyeong Joo Jung
Ohio State University

Lucie Ahn
Case Western Reserve University

Minchae Chloe Kang
Texas A&M University

Saeyeong Jeon
University of Florida

Sanghyun Jeon
UIUC

Serin Lee
MIT

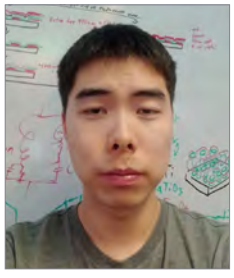
Seungri Kim
The City College of New York

Seungweon Park
Vanderbilt University School of Medicine

Soohwan Kim
Georgia Institute of Technology

Soonmyung Hwang
Icahn School of Medicine at Mount Sinai

Taeyoon Jung
University of Washington



Ilhan Bok
University of Wisconsin-Madison

Yejin Ki
University of Pittsburgh School of Dental Medicine

UKC 2023 Sponsors

Co-Organizations

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Korean Federation of
Science & Technology Societies

KUSCO NRF
KOREA-U.S. SCIENCE COOPERATION CENTER
National Research Foundation of Korea

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Korea Health Industry Development Institute

KICT 한국건설기술연구원

KIST
Korea Institute of Science and Technology

KISTEP
한국과학기술기획평가원
Korea Institute of S&T Evaluation and Planning

KNU 경북대학교

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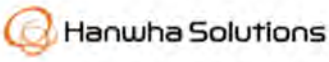

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KOSEN

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POSTECH Pohang University of Science and Technology

KASI 한국천문연구원 Korea Astronomy & Space Science Institute

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KUSCO
KOREA-U.S. SCIENCE COOPERATION CENTER

The Korea-U.S. Science Cooperation Center (KUSCO) is a non-profit organization established in Vienna, Virginia, founded in 1997, to accomplish two major missions: to enhance cooperative efforts in S&T between Korea and the U.S. and to support Korean - American scientists & engineers in the United States.

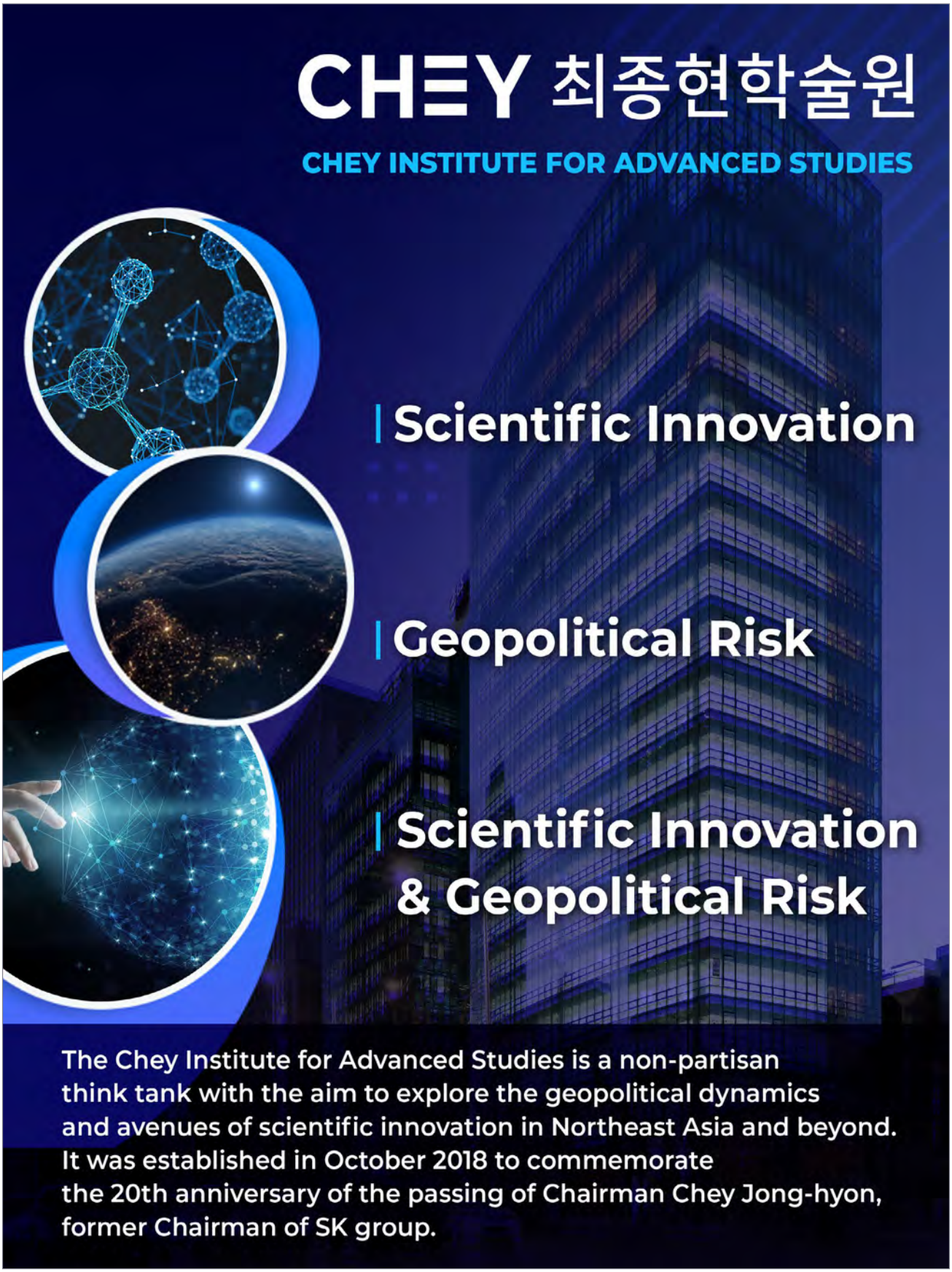
VISION & MISSION

The vision of KUSCO is *"Advancement of the S&T collaborations between Korea and the U.S."*
To realize its vision, KUSCO pursues the mission of becoming a premium center for S&T cooperation and Exchanges by pursuing three goals as follows:

- To strengthen S&T cooperation portfolio between Korea and the U.S.
- To broaden global exchange programs
- To support and leverage Korean-American scientists and engineers

MAJOR ACTIVITIES

- Enhance scientific and technological development of both Korea and the U.S.
- Support mutual cooperation and initiate joint programs with U.S. and Korean scientific and engineering societies, academic universities, and other institutions
- Assess significant trends in scientific research and technological developments affecting Korea and the U.S.
- Assist young Korean-American and other scientists in developing and maintaining networks addressing matters of scientific and technical interest to the two countries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It was established in October 2018 to commemorate
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former Chairman of SK group.

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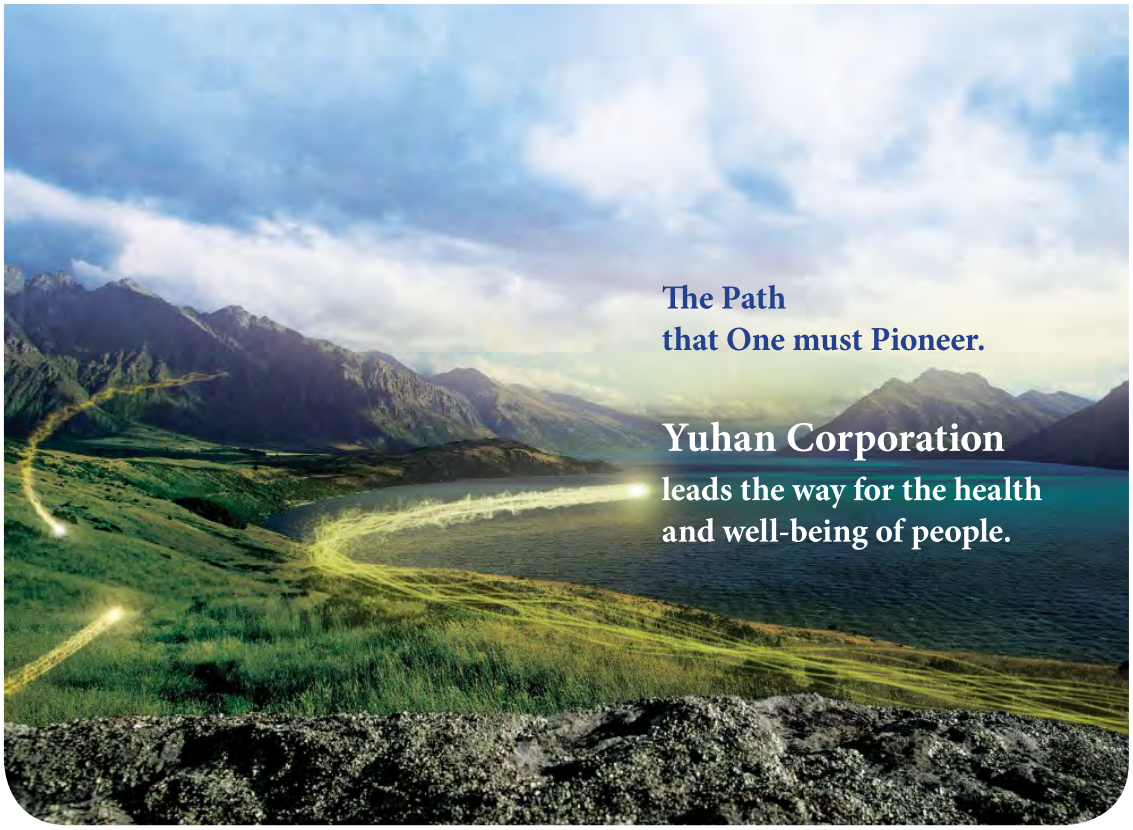

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  - ✓ SEED Poster Session
  - ✓ SEED Teatime Session
  - ✓ Networking Dinner

Fields of Interest

- 건축공학
- 도시공학
- 화학공학
- 정보시스템
- 전기생체공학부
- 바이오메디컬
- 기계공학
- 산업공학
- 미래자동차공학
- AI
- 반도체

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·Establishing open research infrastructure for convergence and cooperation Nationwide research support network

National research support network

·Establishing research infrastructure for open research convergence and cooperation




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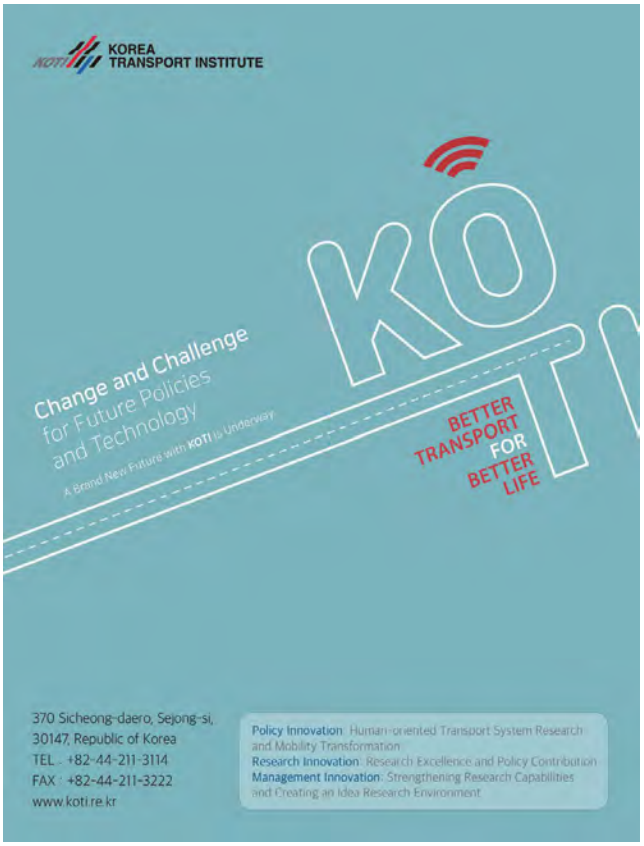
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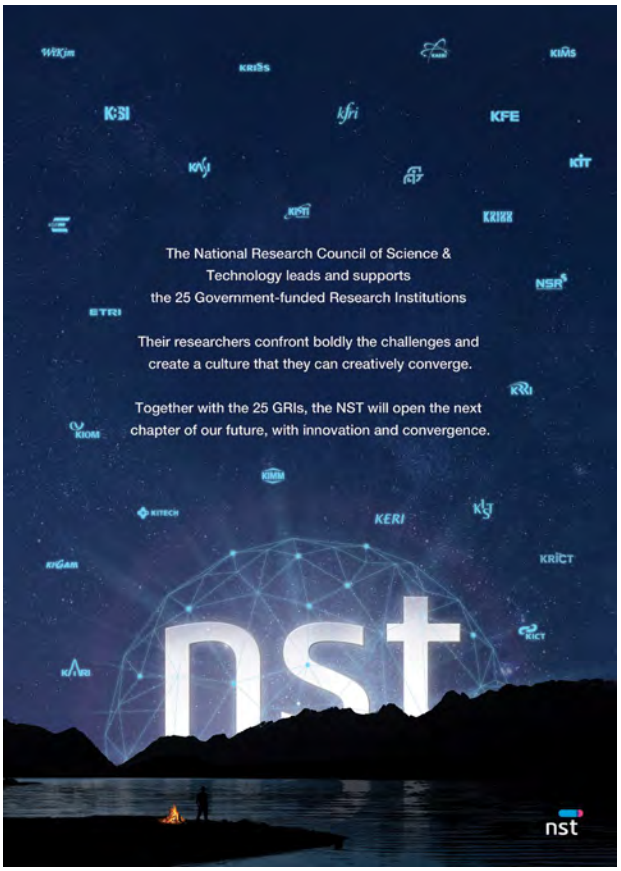
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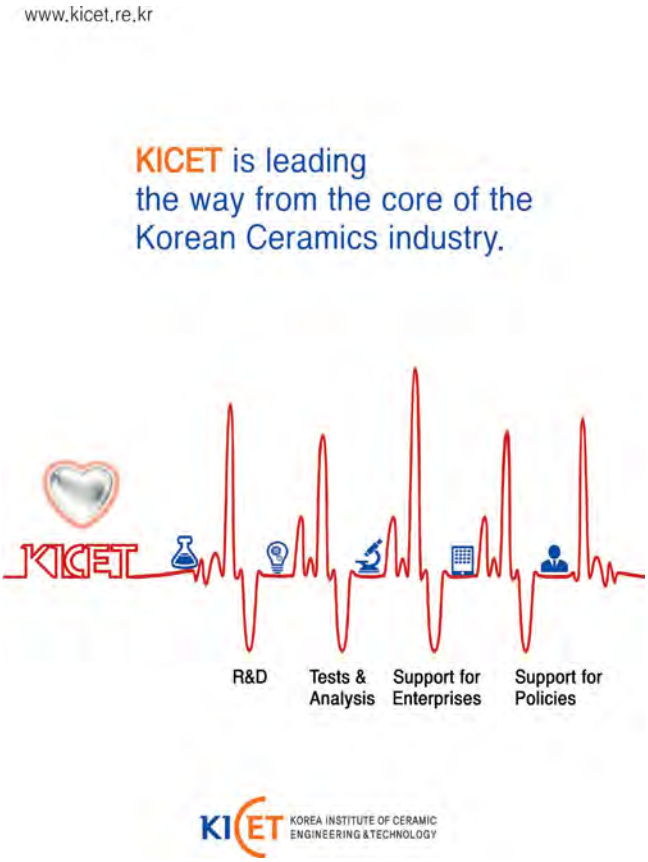
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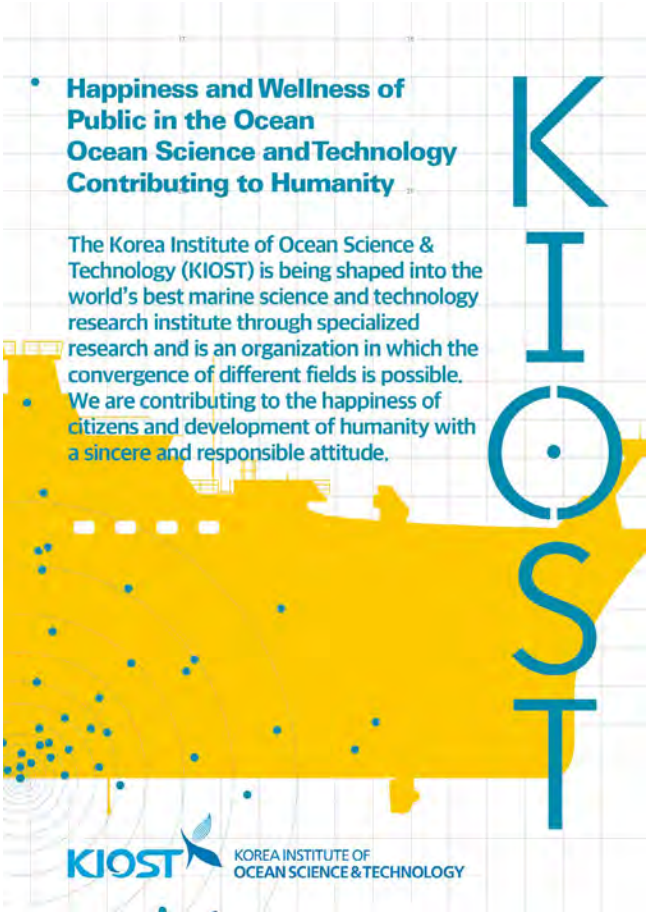
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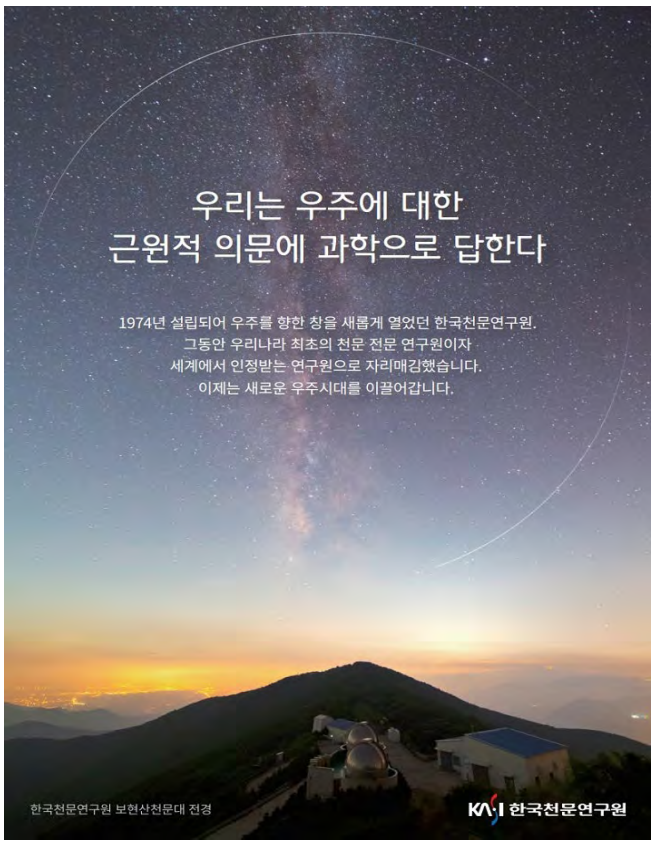
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WISET 한국여성과학기술인육성재단
Korea Foundation for Women in Science, Engineering and Technology
DIVERSITY & INCLUSION IN STEM
Mission & Vision
MISSION
To empower women in STEM to demonstrate their strength and contribute to social value
VISION
The world's leading institution that fosters women in STEM who will take the lead in promoting science and technology-based economic growth
Main Functions
Conducting government-commissioned projects on women in STEM
Providing educations/training programs for women in STEM
Operating career development programs
Conducting policy research and analysis on women in STEM
Improving women's representation in STEM and achieving gender equality
Communicating and collaborating with domestic and international organizations
Organization History
Organization Overview
Legal basis of establishment | Article 14 of ACT ON FOSTERING AND SUPPORTING WOMEN SCIENTISTS AND TECHNICIANS
Date of establishment | April 1, 2013
Affiliated organization of the Ministry of Science and ICT
Jan. 2011
Establishment of Center for Women in Science, Engineering and Technology
Jan. 2013
WISET established as a non-profit organization (Director Hasook Lee)
May 2013
Launching Center for Science, Engineering, and Technology Cooperatives (by Ministry of Science and ICT)
Aug. 2014
Launching Seoul Job Center for Women in Science, Engineering, and Technology & Expansion and relocation of WISET Academy (by Ministry of Gender Equality and Family)
Nov. 2022
June. 2021
Changed the name of the organization to Korea Foundation for Women In Science, Engineering and Technology
Jan. 2017
WISET designated as a public organization
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