



香港中文大學
The Chinese University of Hong Kong



研究及知識轉移服務處
Office of Research and
Knowledge Transfer Services

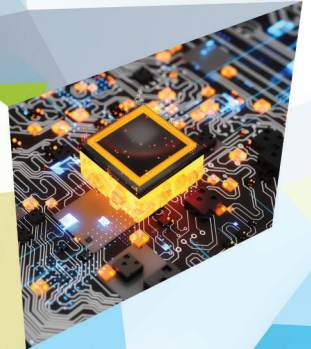


CUHK
INNOVATION DAY
中大創新日

INNOVATION, PATENTS AND BEYOND
創新創意 盡在其中

CUHK INNOVATION DAY 中大創新日 2022

28 OCTOBER 2022 (FRIDAY)
2022年10月28日 (星期五)



QUICK FACTS ON CUHK RESEARCH AND INNOVATION

11th **38th**
in Asia in the World
★★★
QS World University Rankings¹

7th **45th**
in Asia in the World
★★★
Times Higher Education Rankings²

26th
in Asia Pacific's
Most Innovative Universities 2019
★★★
Most Innovative University in Hong Kong³

Top 100
★★★
Worldwide universities
Granted U.S. Utility Patents⁴

**74% CUHK
research**
rated as world-leading or
internationally excellent⁵

**Most Patents
Granted**
University in Hong Kong in
4 consecutive years⁶

In 2021/22

 **419**
Patents Filed

 **264**
Patents Granted

 **45**
Licences Granted

Total number to date

 **3700+**
Patents Filed

 **1500+**
Patents Granted

 **1000+**
Inventions

 **63**
Technology
Start-up
Companies

 **141**
Student Start-up
Projects

 **18**
Social
Enterprises

 **245**
Community-based
Knowledge Transfer
Projects

1. <https://www.topuniversities.com/university-rankings/world-university-rankings/2023>
2. <https://www.timeshighereducation.com/world-university-rankings>
3. <https://graphics.reuters.com/ASIA-UNIVERSITY-INNOVATION/0100B02G03Z/index.html>
4. <https://academyofinventors.org/top-100/>
5. Research Assessment Exercise 2020 Hong Kong, University Grants Committee
6. Since 2017/18

Welcome to CUHK Innovation Day 2022!

A champion of research and innovation that creates value and brings benefits to society, CUHK is recognized today as a leading research university in Asia and among the best in the world. As set out in our latest 5-year strategic plan "CUHK 2025", CUHK will focus on integrating research, innovation and enterprise into a dynamic and productive continuum, which enables the translation of research into tangible benefits and the delivery of innovation to the world.

Our university has been widely recognized as one of the most innovative universities in the city and the region. For 4 consecutive years since 2017-18, CUHK has been ranked as the most patents granted university in Hong Kong. In 2021-22 alone, we have filed over 410 patent applications worldwide with 264 patents granted around the world. Our inventors have also completed over 70 new invention disclosures, a record high over the past 5 years. The University is also proud to see the recent establishment of 6 InnoHK Centres supported by the HKSAR Government to translate our world-class research discoveries into tangible impact on a local, national and global scale.

The achievements above are results of our devotion in inspiring and encouraging the CUHK community to innovate for societal impact – which is the key objective of the CUHK Innovation Day. This year's event features three thematic sessions covering vaccinology, microelectronics and carbon neutrality, in which the domain experts will share their insights into the current global challenges. To foster exchange of ideas and facilitate collaboration, CUHK start-ups and InnoHK Centres will also showcase their latest research and technology at the event.

I would like to take this opportunity to express my appreciation to ORKTS colleagues, as well as all partners and sponsors for their staunch support to make this event possible and successful.

I am sure you will benefit from the enriching programme and valuable networking opportunities offered in CUHK Innovation Day 2022. May we join hands together to extend and expand the impact of knowledge and innovation for the betterment of our society.



Professor Rocky Tuan

Vice-Chancellor and President,
The Chinese University of Hong Kong

| | |
|--|----------------|
| Programme Rundown | 4 - 5 |
| Floor Plan | 6 - 7 |
| Officiating Guests | 8 - 9 |
| Thematic Session 1: Vaccinology | 10 - 13 |
| Thematic Session 2: Microelectronics | 14 - 15 |
| Thematic Session 3: Carbon Neutrality | 16 - 17 |
| Elevator Pitch Competition | 18 - 19 |
| Exhibition Booths | |
| • CUHK InnoHK Centres | 20 - 22 |
| • CUHK Technology Startups | 23 - 31 |
| • China Engagement Office, CUHK | 31 |
| Acknowledgement | 32 |

PROGRAMME RUNDOWN

Morning Session

OPENING SESSION

- 09:30 – 10:00** **Registration**
- 10:00 – 10:10** **Opening Speech**
Prof. Rocky TUAN, Vice-Chancellor and President, CUHK
- 10:10 – 10:30** **Kick-off Ceremony**
Officiating Guests
- Prof. Dong SUN, JP, Secretary for Innovation, Technology and Industry, HKSAR
 - Prof. John CHAI, BBS, JP, Chairman of the Council, CUHK
 - Prof. Rocky TUAN, Vice-Chancellor and President, CUHK
 - Prof. Alan CHAN, Provost, CUHK
 - Prof. Mai Har SHAM, Pro-Vice-Chancellor/ Vice-President (Research), CUHK
 - Prof. Benny ZEE, Director, Office of Research and Knowledge Transfer Services, CUHK

THEMATIC SESSION 1: VACCINOLOGY

- 10:30 – 10:50** **Design of Lipid Nanoparticles for mRNA Vaccine**
Dr. Linxian LI, Ming Wai Lau Centre for Reparative Medicine, Karolinska Institutet
- 10:50 – 11:10** **Predicting Vaccine Effectiveness Against New Genetic Variants and Reverse Vaccinology**
Prof. Maggie Haitian WANG, The Jockey Club School of Public Health and Primary Care, Faculty of Medicine, CUHK
- 11:10 – 11:30** **Computational and Structural Biology Approaches to Address Challenges of an Effective Vaccine**
Prof. Peter Pak Hang CHEUNG, Department of Chemical Pathology, Faculty of Medicine, CUHK
- 11:30 – 11:45** **Break**
- 11:45 – 12:30** **Panel Discussion on Vaccinology**
- Moderator:**
Prof. Benny ZEE, Director, Office of Research and Knowledge Transfer Services, CUHK
- Panelists (listed in alphabetical order):**
- Prof. Renee Wan Yi CHAN, Department of Paediatrics, Faculty of Medicine, CUHK
 - Prof. Zigui CHEN, Department of Microbiology, Faculty of Medicine, CUHK
 - Prof. Peter Pak Hang CHEUNG, Department of Chemical Pathology, Faculty of Medicine, CUHK
 - Prof. Chris Ka Pun MOK, The Jockey Club School of Public Health and Primary Care, Faculty of Medicine, CUHK
 - Prof. Hein Min TUN, The Jockey Club School of Public Health and Primary Care, Faculty of Medicine, CUHK
 - Prof. Maggie Haitian WANG, The Jockey Club School of Public Health and Primary Care, Faculty of Medicine, CUHK
- 12:30 – 13:30** **Elevator Pitch Competition**
- 13:30 – 14:00** **Break**

Afternoon Session

- 14:00 – 14:15** **Welcome Remarks and Award Presentation**
Prof. Mai Har SHAM, Pro-Vice-Chancellor / Vice-President (Research), CUHK

THEMATIC SESSION 2: MICROELECTRONICS

- 14:15 – 14:35** **Electronic Design Automation (EDA)**
Prof. Martin D. F. WONG, Dean, Faculty of Engineering, CUHK
- 14:35 – 14:55** **Silicon Photonics: Advances in Communications, Sensing and Computing beyond Moore's Law with the use of Photons in Silicon Chips**
Prof. Hon Ki TSANG, Department of Electronic Engineering, Faculty of Engineering, CUHK
- 14:55 – 15:15** **New Generation Medical Devices Enabled by Hybrid and Nanostructured Semiconductors**
Prof. Ni ZHAO, Department of Electronic Engineering, Faculty of Engineering, CUHK

- 15:15 – 15:25** **Break**

THEMATIC SESSION 3: CARBON NEUTRALITY

- 15:25 – 15:45** **Safe and Low Cost Aqueous Energy Storage Technologies and Their Applications**
Prof. Yi-Chun LU, Department of Mechanical and Automation Engineering, Faculty of Engineering, CUHK
- 15:45 – 16:05** **Learn to Fabricate High-performance Third-Generation Solar Cells with Grazing Incidence Scattering Techniques**
Prof. Xinhui LU, Department of Physics, Faculty of Science, CUHK
- 16:05 – 16:25** **Pathways Towards Carbon Neutral Chemical Industries**
Prof. Ying WANG, Department of Chemistry, Faculty of Science, CUHK
- 16:25 – 16:30** **Closing Remarks**
Prof. Benny ZEE, Director, Office of Research and Knowledge Transfer Services, CUHK

FLOOR PLAN

CUHK InnoHK Centres

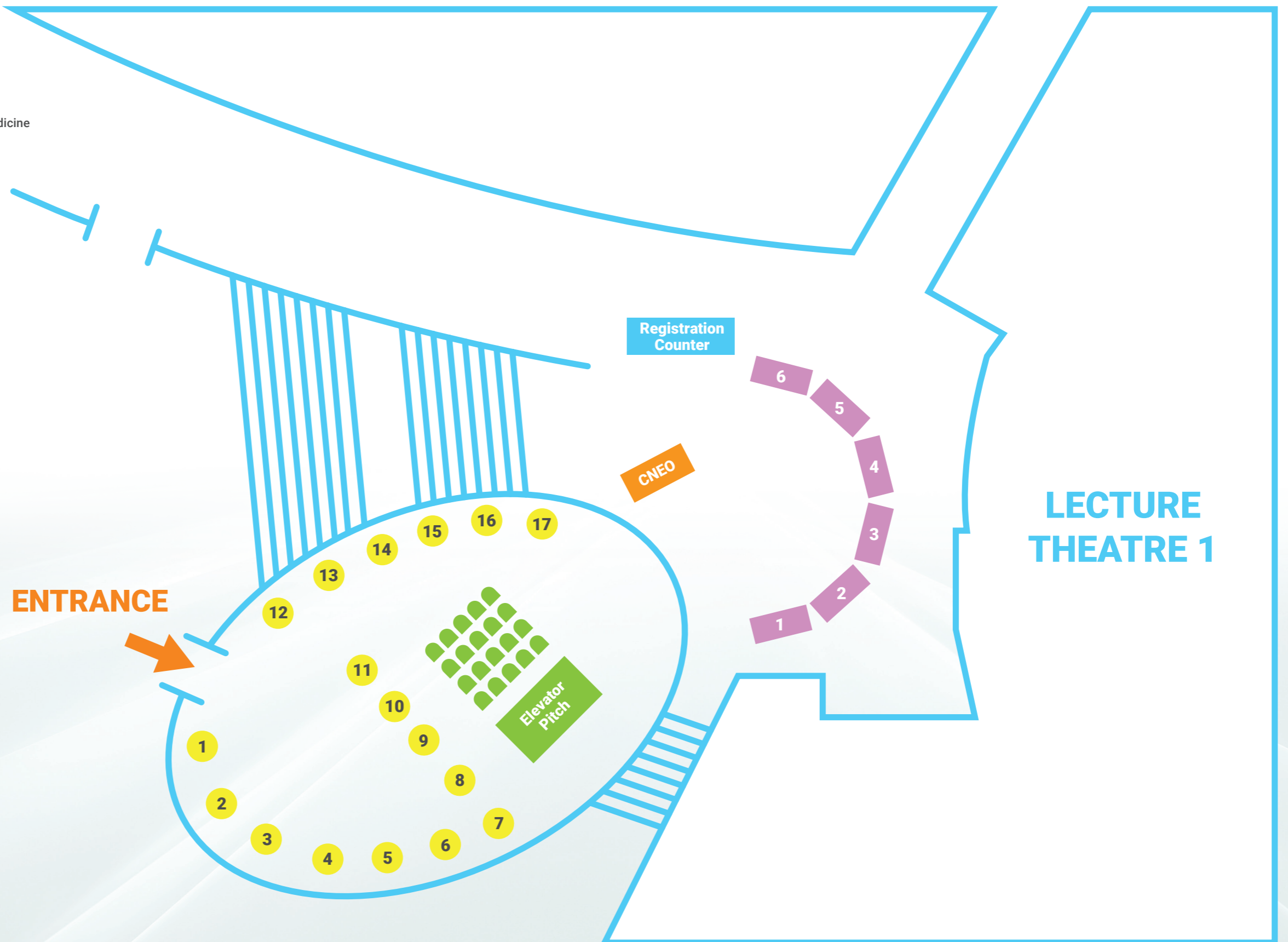
- 1 Microbiota I-Center
- 2 Centre for Novostics
- 3 Center for Neuromusculoskeletal Restorative Medicine
- 4 Multi-Scale Medical Robotics Centre
- 5 Centre for Perceptual and Interactive Intelligence
- 6 Hong Kong Centre for Logistics Robotics

CUHK Technology Startups

- 1 Beth Bioinformatics Co., Limited
- 2 GenieBiome Limited
- 3 Luquos Energy Limited
- 4 O-Spheres Limited
- 5 Capmi Technology Limited
- 6 CUBE Robotics Limited
- 7 DepthVision Limited
- 8 Golden Biotech Limited
- 9 Hopebotics Limited
- 10 Illuminatio Medical Technology Limited
- 11 LaSense Technology Limited
- 12 MicroMag Healthcare Limited
- 13 Precision Cut Limited
- 14 Targene Biotech (Hong Kong) Limited
- 15 ThingX Technologies Limited
- 16 TiFi Technologies Limited
- 17 Ynno Med Limited

CNEO

China Engagement Office, CUHK



OFFICIATING GUESTS



Professor Dong SUN, JP

Secretary for Innovation, Technology and Industry
Government of the Hong Kong Special Administrative Region

Professor Dong SUN is appointed Secretary for Innovation, Technology and Industry on 1 July 2022. Professor Sun is a world-renowned scholar and scientist. He is a pioneer in robotic manipulation of biological cells and robot control. His research has led to breakthroughs in the use of robotics combined with various micro-engineering tools. He has also received numerous awards.

Professor Sun was elected as Fellow of Canadian Academy of Engineering, Member of the European Academy of Sciences and Arts, Fellow of the International Academy of Medical and Biological Engineering, and Fellow of IEEE. Prior to his appointment, Professor Sun was the Chair Professor and Head of the Department of Biomedical Engineering at City University of Hong Kong, and the Legislative Council Member (Election Committee).

Professor John Y. CHAI, BBS, JP

Chairman of the Council
The Chinese University of Hong Kong

Professor Chai is the Chairman of the University Council of The Chinese University of Hong Kong (CUHK). Before joining CUHK, he served as the Vice-Chairman of the University Council of The Hong Kong University of Science and Technology (HKUST) from 2015 to 2021.

Professor Chai is a Professor Emeritus at Northwestern University and an Honorary Clinical Professor at the Faculty of Dentistry of The University of Hong Kong (HKU). Professor Chai has been a member of the Chief Executive's Council of Advisers on Innovation and Strategic Development, HKSAR since 2018 and Director of Hong Kong-Shenzhen Innovation and Technology Park Limited since 2017.



Professor Rocky TUAN

Vice-Chancellor / President
Lee Quo Wei and Lee Yick Hoi Lun Professor of Tissue Engineering and Regenerative Medicine
The Chinese University of Hong Kong

Professor Rocky S. Tuan assumed office as the eighth Vice-Chancellor and President of The Chinese University of Hong Kong (CUHK) on 1 January 2018. Born and raised in Hong Kong, he pursued further studies in the United States and received his PhD in Life Sciences in 1977 from the Rockefeller University in New York. He is concurrently Lee Quo Wei and Lee Yick Hoi Lun Professor of Tissue Engineering and Regenerative Medicine at CUHK.

Professor Tuan is an internationally renowned biomedical scientist specializing in musculoskeletal biology and tissue regeneration, whose work covers both basic science and engineering, as well as translational and clinical applications. Prior to joining CUHK in 2016 as a Distinguished Visiting Professor and the Founding Director of the Institute for Tissue Engineering and Regenerative Medicine, Professor Tuan was Distinguished Professor of Orthopaedic Surgery at the University of Pittsburgh (Pitt) School of Medicine, where he served from 2009 as the Founding Director of the Center for Cellular and Molecular Engineering, and as Arthur J. Rooney, Sr. Chair Professor of Sports Medicine and Executive Vice-Chairman of the Department of Orthopaedic Surgery, with a joint appointment as Professor in the Department of Bioengineering and the Department of Mechanical Engineering and Materials Science. In 2012, Professor Tuan was appointed by Pitt as Associate Director of the McGowan Institute for Regenerative Medicine and Founding Director of the Center for Military Medicine Research.

In 2017, 2018 and 2019, Professor Tuan was elected to the fellowships of the National Academy of Inventors (NAI), the Chinese Association of Inventions (CAI) and the American Association for Anatomy (AAA) respectively. In 2021, Professor Tuan was also elected to be the fellowships of the Orthopaedic Research Society (ORS) and the Tissue Engineering and Regenerative Medicine International Society (TERMIS), for his accomplishments in innovation and translational research that bring significant impact on society.



Professor Alan CHAN

Provost
J.S. Lee Professor of Chinese Culture
The Chinese University of Hong Kong

Professor Alan Chan is currently the Provost and J.S. Lee Professor of Chinese Culture at The Chinese University of Hong Kong. Prior to joining CUHK, Professor Chan was Toh Puan Mahani Idris Daim Chair Professor of Humanities at the Nanyang Technological University (NTU) of Singapore. He joined NTU as Dean of the College of Humanities, Arts, and Social Sciences, and Professor of Philosophy in 2009. In January 2018, Professor Chan was appointed Vice President of NTU, responsible for alumni engagement, university advancement and international relations.

Professor Chan was born in Hong Kong and completed his secondary school education here. He then pursued his higher education in Canada. He received his BA from the University of Winnipeg, MA from the University of Manitoba, and PhD in religious studies from the University of Toronto. Professor Chan began his academic career as an assistant professor at the University of Manitoba. He then joined the National University of Singapore (NUS), where he held several leadership roles, including the Vice-Dean of the Faculty of Arts and Social Sciences, and Associate Provost (Undergraduate Education). While at NUS, Professor Chan twice received the Teaching Excellence Award.

Professor Chan's research focuses on Chinese philosophy and religion, and hermeneutics and critical theory. He is a member of the Board of Directors of Association of Pacific Rim Universities (APRU), the Co-chair of the International Policy Advisory Committee, APRU, the Vice-Chair of the Board of the Shenzhen Institutes of Advanced Technology and a member of the Governing Council of International Confucian Association, China. He is also a member of the University Grants Committee, Hong Kong and the Governing Board of The Chinese University of Hong Kong, Shenzhen, China. Professor Chan has published widely and developed an online course on "Explorations in Confucian Philosophy," which has drawn over 10,000 learners on Coursera.

Professor Mai-har SHAM

Pro-Vice-Chancellor / Vice-President (Research)
Choh-Ming Li Professor of Biomedical Sciences
The Chinese University of Hong Kong

Professor Mai Har Sham is a Pro-Vice-Chancellor of The Chinese University of Hong Kong (CUHK) and Choh-Ming Li Professor of Biomedical Sciences. She was a recipient of the Croucher Foundation Scholarship and completed her PhD in Biochemistry at the University of Cambridge.

As a developmental geneticist, Professor Sham's research focuses on the molecular mechanisms of mammalian development, stem cells and tissue regeneration, and human congenital disorders. Besides, she has extensive experience in research management and leadership, especially working with the international consortium to promote responsible conduct of research in universities and research institutions.

Professor Sham is currently the President of the Hong Kong Society of Developmental Biology. She also serves on the Editorial Board of Cell & Bioscience and Annual Review of Genomics and Human Genetics.



Professor Benny ZEE

Director, Office of Research and Knowledge Transfer Services
The Chinese University of Hong Kong

Professor Benny Zee is Director, Office of Research and Knowledge Transfer Services (ORKTS) of the Chinese University of Hong Kong (CUHK). He is also Professor and Director of the Centre for Clinical Research and Biostatistics (CCRB) of the Jockey Club School of Public Health and Primary Care, and Director of Clinical Trials and Biostatistics Lab in the CU Shenzhen Research Institute (SZRI). He holds honorary appointments in the Department of Clinical Oncology and the Department of Statistics of CUHK. He is also the Chairman of the Joint CUHK-NTEC Clinical Research Ethics Committee from 2006-2020.

Professor Zee obtained his Ph.D in Biostatistics from the University of Pittsburgh USA in 1987. He then joined the National Cancer Institute of Canada Clinical Trials Group as Senior Biostatistician, and faculty member in the Department of Community Health and Epidemiology and the Department of Mathematics and Statistics of Queen's University Canada from 1987-2001. He remains as Adjunct Professor with Queen's University after he joined CUHK and is actively promoting international academic activities and collaborations.

THEMATIC SESSION 1: VACCINOLOGY



Dr. Linxian LI

Assistant Professor
Ming Wai Lau Centre for Reparative Medicine
Karolinska Institutet

Dr. Linxian Li obtained his PhD degree at University of Heidelberg in Germany, and he pursued postdoctoral research at Massachusetts Institute of Technology under the supervision of Prof. Robert Langer. In 2017, Dr. Li was among the first batch of young Chinese researchers to receive the MIT Technology Review Innovators Under 35 Awards. He was listed as a pioneer for exploring the therapeutic potentials of human messenger RNA (mRNA). After working on lipid nanoparticles (LNP) for more than 10 years, Dr. Li founded InnoRNA in 2019. InnoRNA is a platform-based biotechnology company focused on developing innovative mRNA and LNP technologies. InnoRNA was listed by MIT Technology Review as the 50 smartest companies in 2020 and 2022. InnoRNA has attracted more than 1 billion HKD investment and established collaborations with BeiGene (NASDAQ:BGNE; 6160.HK; 688235.SH) and Zhifei Biological (300122.SZ) to develop mRNA therapeutics and vaccines.

Design of lipid nanoparticles for mRNA vaccine

Messenger RNA is a natural biological molecule that works as the template to produce proteins in our body. mRNA can be developed into prophylactic vaccines, cancer vaccines, intracellular therapeutics, regenerative therapeutics, etc. However, mRNA can't enter the cell by itself to function. The delivery system is the key to fully utilise therapeutic potentials of mRNA. The state-of-the-art delivery system for mRNA is lipid nanoparticles. During the pandemic, FDA has approved two mRNA vaccines for SARS-CoV-2 virus and both vaccines used lipid nanoparticles as the carrier for mRNA. The lipid nanoparticle is a multi-layer lipid membrane system that encapsulates mRNAs between the layers. The core component of LNP is the ionizable lipid, which is a synthetic lipid that binds to the mRNA and encapsulates it within LNPs. Early discovery found that chemical structures of ionizable lipids relate with the delivery efficiency and toxicity of LNPs.

Dr. Li has developed the unique LNP platform to generate thousands of structurally diverse ionizable lipids and screen them to find the best LNP for a variety of therapeutic applications. One application is to reduce the side effects of mRNA vaccine associated with LNPs, such as injection pain. Dr. Li's team is developing new LNPs with selective immune activation that results in less side effects.



Prof. Maggie Haitian WANG

Associate Professor
The Jockey Club School of Public Health and Primary Care, Faculty of Medicine
The Chinese University of Hong Kong

Dr. Maggie Haitian Wang is an Associate Professor in the JC School of Public Health and Primary Care, Faculty of Medicine, The Chinese University of Hong Kong (CUHK). She received her bachelor's degree (Hon) in Physics in 2005 and PhD degree in Statistics in 2011 from the Hong Kong University of Science and Technology (HKUST). Her research interest is developing statistical and bioinformatic methods towards better vaccine design and human genome interpretation. She serves as a board member of the International Genetic Epidemiology Society (IGES) and a review editor of Human Genetics.

Predicting Vaccine Effectiveness Against New Genetic Variants and Reverse Vaccinology

The effectiveness of vaccines varies with the matching of vaccine strains to circulating strains. Based on the genetic distance of surface proteins of the viruses to vaccine strains, we develop computational biology approach to quantify the relationship between genetic mismatch and vaccine effectiveness (VE) for influenza A/H1N1pdm09, A/H3N2, influenza B and COVID-19. Evident relationships were identified and validated in independent data. The modelling framework may enable in silico prediction for VE on a real-time basis and inform vaccine design and public health planning.



Prof. Peter Pak Hang CHEUNG

Assistant Professor
Department of Chemical Pathology, Faculty of Medicine
The Chinese University of Hong Kong

Dr. Peter Cheung is currently an Assistant Dean (Research) and Assistant Professor in the Department of Chemical Pathology, Faculty of Medicine at The Chinese University of Hong Kong. He obtained his bachelor's and Master's degree from Queen's University, Canada, and Western University, Canada, respectively, and his doctorate degree from The University of Hong Kong. Dr. Cheung's research interest focuses on using computational, statistical, structural, and enzymological approaches to study viral replications and prevention strategies for infectious diseases. He is the recipient of numerous awards including the Croucher-Butterfield Ph.D. Scholarship (Croucher Foundation), Best Poster Presentation Award (The University of Hong Kong), and Finalist of the Hong Kong Young Scientist Award (Hong Kong Institution of Science). He has published extensively in the field of computational and structural biology. His original research findings have been published as first or corresponding authors in leading international journals including those of the Lancet Microbe, BMJ, Nature Catalysis, Nucleic Acids Research, and Nature Communications. His work has been supported by the Research Grants Committee's General Research Fund and Collaborative Research Fund, with which he led international efforts to study viral replication of influenza and SARS-CoV-2 replication using structural, computational, and enzymology approaches.

Computational and Structural Biology Approaches to Address Challenges of an Effective Vaccine

We will first discuss our recent studies on COVID-19 vaccination effectiveness. Then, challenges to vaccine development will be highlighted, such as protection for high-risk populations, the evolution of antibody escape variants, and the production of stable vaccine strains. We have employed computational, structural biology, and statistical approaches to try to overcome these challenges.

Currently, there is a lack of studies on booster regimens composed of vaccine combinations, especially for older and immunocompromised groups. We performed a comprehensive analysis with the largest sample size to date to assess 24 COVID-19 vaccination regimens encompassing 7 vaccine types worldwide. We showed that a three-dose mRNA regimen reduces the chance of immunocompromised and elderly (over 65) patients developing asymptomatic or symptomatic COVID-19 infections, and a third dose is necessary to protect against Omicron infection. The findings will help shape public health policy, patient care, and vaccination research. Ongoing investigations focus on the effectiveness of the fourth dosage regimen against novel variants. To prepare for future variants, especially those that may elude vaccination neutralization, we are developing computer models to evaluate viral fitness and construct their antigenic evolutionary paths. This technique can profile present variants and forecast future antigenic variants, hence facilitating pandemic preparedness. Lastly, we will show how structural biology can facilitate the design of innovative inactivated virus vaccines with high genetic stability while maintaining a high virus replication rate for manufacturing.

THEMATIC SESSION 1: PANEL DISCUSSION ON VACCINOLOGY

Moderator



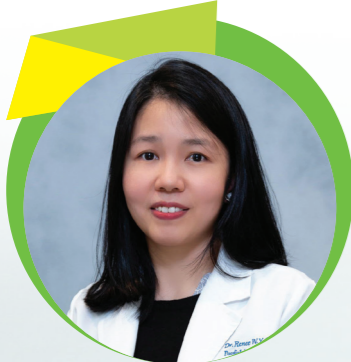
Prof. Benny ZEE

Director
Office of Research and Knowledge Transfer Services
The Chinese University of Hong Kong

Professor Benny Zee is Director, Office of Research and Knowledge Transfer Services (ORKTS) of the Chinese University of Hong Kong (CUHK). He is also Professor and Director of the Centre for Clinical Research and Biostatistics (CCRB) of the Jockey Club School of Public Health and Primary Care, and Director of Clinical Trials and Biostatistics Lab in the CU Shenzhen Research Institute (SZRI). He holds honorary appointments in the Department of Clinical Oncology and the Department of Statistics of CUHK. He is also the Chairman of the Joint CUHK-NTEC Clinical Research Ethics Committee from 2006-2020.

Professor Zee obtained his Ph.D in Biostatistics from the University of Pittsburgh USA in 1987. He then joined the National Cancer Institute of Canada Clinical Trials Group as Senior Biostatistician, and faculty member in the Department of Community Health and Epidemiology and the Department of Mathematics and Statistics of Queen's University Canada from 1987-2001. He remains as Adjunct Professor with Queen's University after he joined CUHK and is actively promoting international academic activities and collaborations

Panelists



Prof. Renee Wan Yi CHAN

Associate Professor
Department of Paediatrics, Faculty of Medicine
The Chinese University of Hong Kong

Dr. Chan is an Associate Professor at Department of Paediatric in the CUHK. She joined the CUHK in 2015 and served as the Deputy Director of the CUHK- Hong Kong Hub of Paediatric Excellence since 2019.

Dr. Chan specializes in respiratory model construction and host-virus interaction. She works on the rhinovirus molecular epidemiology, tropism, and host interaction in relation to respiratory allergy, asthma, and chronic obstructive pulmonary disease. During the COVID19, she pioneers the use of nasal strip as a non-invasive tool to collect the nasal epithelial lining fluid for viral antigen, mucosal antibody detection, and host mediators monitoring.



Prof. Zigui CHEN

Associate Professor
Department of Microbiology, Faculty of Medicine
The Chinese University of Hong Kong

Dr. Chen has a strong foundation in molecular evolution and bioinformatics. He is leading a Next-Generation sequencing and bioinformatics laboratory, and actively involves in a multidisciplinary research team on different aspects of human virome and microbiome, including the emerging infectious diseases such as COVID-19 and Influenza, which yields valuable insight into the complex host-microbe interactions, clinical management and therapeutic intervention. Dr. Chen is a Principal Investigator of several UGC-funded research grants and enjoys interdisciplinary collaborations with local and overseas researchers and industries, with over 160 peer-reviewed papers published in the field of viruses and microbiology.



Prof. Peter Pak Hang CHEUNG

Assistant Professor
Department of Chemical Pathology, Faculty of Medicine
The Chinese University of Hong Kong

Dr. Peter Cheung is currently an Assistant Dean (Research) and Assistant Professor in the Department of Chemical Pathology, Faculty of Medicine at The Chinese University of Hong Kong. He obtained his bachelor's and Master's degree from Queen's University, Canada, and Western University, Canada, respectively, and his doctorate degree from The University of Hong Kong. Dr. Cheung's research interest focuses on using computational, statistical, structural, and enzymological approaches to study viral replications and prevention strategies for infectious diseases. He is the recipient of numerous awards including the Croucher-Butterfield Ph.D. Scholarship (Croucher Foundation), Best Poster Presentation Award (The University of Hong Kong), and Finalist of the Hong Kong Young Scientist Award (Hong Kong Institution of Science). He has published extensively in the field of computational and structural biology. His original research findings have been published as first or corresponding authors in leading international journals including those of the Lancet Microbe, BMJ, Nature Catalysis, Nucleic Acids Research, and Nature Communications. His work has been supported by the Research Grants Committee's General Research Fund and Collaborative Research Fund, with which he led international efforts to study viral replication of influenza and SARS-CoV-2 replication using structural, computational, and enzymology approaches.



Prof. Chris Ka Pun MOK

Assistant Professor
The Jockey Club School of Public Health and Primary Care, Faculty of Medicine
The Chinese University of Hong Kong

Dr. Mok is currently an Assistant Professor in The Jockey Club School of Public Health and Primary Care, The Chinese University of Hong Kong. His group focuses on the virology and immunology of emerging infectious diseases including influenza and coronavirus. He is particularly interested to understand how the adaptive immunity is regulated and sharpen by the evolution of respiratory viruses which will help to further improve the design of new vaccines. Dr. Mok has over 10 years of experience to perform in vitro and in vivo experiments under biosafety level 3 containment. He is now the associate editor of Virology Journal and Frontier of Immunology.



Prof. Hein Min TUN

Associate Professor
The Jockey Club School of Public Health and Primary Care, Faculty of Medicine
The Chinese University of Hong Kong

Hein Tun is a public health veterinarian, currently an Associate Professor at the JC School of Public Health and Primary Care, CUHK and Microbiota I-Center Limited. He is also an Adjunct Professor at Nanjing Medical University and an Adjunct Associate Professor at HKU. His research interests range from studying the role of microbiome in health and diseases to One Health surveillance of antimicrobial-resistant bacteria and resistome. He has published more than 80 research articles, most of them in high impact journals such as Gut, Gastroenterology, JAMA Pediatrics, Lancet Microbe, Nature Communication etc. Moreover, he received several international research awards and fellowships including Gold Medal at 2021 Inventions Geneva Evaluation Days.



Prof. Maggie Haitian WANG

Associate Professor
The Jockey Club School of Public Health and Primary Care, Faculty of Medicine
The Chinese University of Hong Kong

Dr. Maggie Haitian Wang is an Associate Professor in the JC School of Public Health and Primary Care, Faculty of Medicine, The Chinese University of Hong Kong (CUHK). She received her bachelor's degree (Hon) in Physics in 2005 and PhD degree in Statistics in 2011 from the Hong Kong University of Science and Technology (HKUST). Her research interest is developing statistical and bioinformatic methods towards better vaccine design and human genome interpretation. She serves as a board member of the International Genetic Epidemiology Society (IGES) and a review editor of Human Genetics.

THEMATIC SESSION 2: MICROELECTRONICS



Prof. Martin D.F. WONG

Dean, Faculty of Engineering
Choh-Ming Li Professor of Computer Science and Engineering
The Chinese University of Hong Kong

Martin D. F. Wong is the Dean of the Faculty of Engineering and Choh-Ming Li Professor of Computer Science and Engineering at the Chinese University of Hong Kong (CUHK) since January 2019. Before he joined CUHK, he was with the University of Illinois at Urbana-Champaign (UIUC) from 2002 to 2018. He was the Executive Associate Dean of the College of Engineering (2012-2018) where he was the 2nd highest rank administrator in the College, and the Edward C. Jordan Professor of Electrical and Computer Engineering. Before UIUC, he was with the University of Texas at Austin where he was a David Bruton Jr. Centennial Professor of Computer Science. Prof. Wong received his Ph.D. in Computer Science from UIUC in 1987. He is internationally known for his research on electronic design automation (EDA). He has published about 500 technical papers. He has supervised and graduated more than 50 Ph.D. students, and many of them now hold leadership positions in industry and academia. He is a Fellow of ACM and IEEE.

Electronic Design Automation (EDA)

Silicon chips are critical in driving today's digital economy. Today's internet, airplanes, cars, cell phones, computers etc. would cease to function without silicon chips. The largest silicon chip today has over 100 billion transistors that are interconnected by hundreds of miles long of wires, all fitting inside an area of the size of a fingertip. The complexity is mind-boggling so the only way to design silicon chips is by software automation. This is called Electronic Design Automation (EDA). In this talk, we will give an introduction of EDA and briefly overview EDA activities at CUHK. In the most recent ranking by CSRankings, CUHK is ranked 1st in the world in EDA research!



Prof. Hon Ki TSANG

Wei Lun Professor of Electronic Engineering
Department of Electronic Engineering, Faculty of Engineering
The Chinese University of Hong Kong

Hon Ki Tsang studied Engineering (Electrical and Information Sciences) at Cambridge University, receiving the BA(Hons) in 1987 and PhD in 1991. He was a Research Fellow in Physics at Bath University before he joined CUHK as an Assistant Professor in 1993. In 2002-03, he took no-pay leave from CUHK, to join Bookham Technology, where he led the team that successfully Telcordia-qualified and field-deployed the first silicon photonics products to carry commercial data-traffic in 2002. He is the Wei Lun Professor of Electronic Engineering, a Fellow of IEEE, a Fellow of Optica, and the Editor-in-Chief of IEEE Journal of Quantum Electronics.

Silicon Photonics: Advances in Communications, Sensing and Computing beyond Moore's Law with the use of Photons in Silicon Chips

With new Extreme Ultraviolet (EUV) photolithography systems reportedly having exorbitant costs of US\$340 million, and the prospect of yet higher costs for the next-generation EUV photolithography systems needed to further shrink the size of transistors, it is becoming apparent that continuing the strategy of reducing transistor size to continue Moore's Law may no longer be the best approach to improve the performance of integrated circuits. Since 2018 microelectronic foundries such as Global Foundries, have been pursuing alternative strategies. Silicon photonics offers new functional capabilities and has the potential to realize advances in system performances beyond what is possible with state-of-the-art microelectronics. Silicon photonics use photons instead of electrons to transmit and process signals in silicon chips which are manufactured with the same mature, high-yield, large-volume manufacturing processes developed for the previous generations (e.g., 65 nm technology node) of silicon microelectronics. Companies developing silicon photonics have already attracted billions of dollars in market valuations in recent years because of the potential applications of silicon photonics in data center transceivers, LIDAR imaging systems for autonomous vehicles, energy-efficient artificial intelligence accelerators and error-tolerant quantum computers. We introduce some of these recent opportunities that are being addressed using silicon photonics in industry before we describe some of the recent research at CUHK on silicon photonics for high-capacity optical interconnects in data centers using polarization and mode-division-multiplexing. We shall also describe our work on silicon photonics for high-speed dynamic optical coherence tomography, and our work on integrated coherent networks for energy-efficient matrix processors.



Prof. Ni ZHAO

Professor
Department of Electronic Engineering, Faculty of Engineering
The Chinese University of Hong Kong

Prof. Ni Zhao received her Ph.D. degree in Physics from University of Cambridge in 2008. From 2008-2010 she worked as a postdoctoral research associate at Massachusetts Institute of Technology. She joined the Department of Electronic Engineering at CUHK in 2010 and is now a Full Professor. Her recent work focuses on development of low-cost energy harvesting devices, nanostructured optoelectronic devices and sensors for biomedical applications. Her research to date has generated over 170 journal publications, with an h-index of 63. Prof. Zhao was listed as Highly Cited Researchers 2018 by Clarivate Analytics and is a Fellow of Royal Society of Chemistry.

New Generation Medical Devices Enabled by Hybrid and Nanostructured Semiconductors

The increasing global demand on renewable energy and personalized healthcare technologies calls for a new generation of optoelectronic devices and sensors that are high-performance, low-cost, flexible, and compatible with arbitrary platforms including human organs. Low-temperature processed hybrid and nanostructured semiconductors are an ideal class of materials for such devices because they can be directly patterned to various 2D and 3D substrates through low-cost printing processes and their electronic and mechanical properties can be easily tuned through composition or morphology tuning. In this talk, I will describe how this class of materials enables a new generation of wearable medical devices. In particular, I will focus on the design of flexible optical and mechanical sensors for noninvasive physiological measurements and robot vision. Firstly, I will introduce how we exploit composition tuning and device engineering to achieve high-sensitivity epidermal optical probes for continuous tracking of heart rate variability, arterial blood pressure and cerebral oxygenation. Secondly, I will talk about the development of new pressure sensors and sensor arrays, with a focus on solving the commonly seen alignment-sensitive and crosstalk issues of the devices.

THEMATIC SESSION 3: CARBON NEUTRALITY



Prof. Yi-Chun LU

Professor
Department of Mechanical and Automation Engineering, Faculty of Engineering
The Chinese University of Hong Kong

Prof. Lu received her Ph.D. from Massachusetts Institute of Technology. She is the Fellow of The Royal Society of Chemistry, Founding Member of Young Academy of Science of Hong Kong, and was the recipient of the RGC Research Fellow (2022), Xplorer Prize (2021), International Battery Materials Association (IBA) Early Career Award (2021), Top 10 Falling Walls Science Breakthroughs of the Year Award (2020), Excellent Young Scientists, National Natural Science Foundation of China (2019), Hong Kong SAR Research Grants Council Early Career Award (2014) etc. Her research focuses on high-energy aqueous batteries, metal-air/metal-sulfur batteries, and redox flow batteries.

Safe and Low Cost Aqueous Energy Storage Technologies and Their Applications

Energy storage system is a critical enabling factor for deploying unstable and intermittent renewable power sources, such as solar and wind power sources. Non-aqueous lithium ion batteries dominate the battery markets owing to its high energy density. However, they are flammable, which could bring catastrophic damages in large-scale applications. Redox flow batteries are promising technologies for large-scale electricity storage, owing to its design flexibility in decoupling power and energy capacity. However, redox flow batteries have been suffering from low energy density, which significantly decreases its competitiveness for both stationary and transportation applications. In this presentation, we will discuss strategies to improve the safety, energy density, and cycle life of Li-ion batteries and redox flow batteries. Ultimately, we aim to enable stable and efficient high-energy-density energy storage systems to address the intermittency of the renewable power sources. This will bridge the gap between intermittent renewable power supplies and power demands in grid-storage and electric-vehicles.



Prof. Xinhui LU

Associate Professor
Department of Physics, Faculty of Science
The Chinese University of Hong Kong

Xinhui Lu is an Associate Professor in the Department of Physics, CUHK. She received her bachelor's degree from Nanjing University and PhD degree from Yale University. Then, she worked as a postdoctoral research associate at Brookhaven National Laboratory before joining CUHK. Her research interest lies in energy related material science, including morphology and device performance of organic and perovskite solar cell materials, bulk and surface structure of functional thin films and synchrotron x-ray scattering techniques. She is a council member of Physical Society of Hong Kong and Chinese Neutron Scattering Society, and Clarivate Highly Cited Researcher 2020.

Learn to Fabricate High-performance Third-Generation Solar Cells with Grazing Incidence Scattering Techniques

Nowadays, solar industry becomes the fastest growing industry due to the rising demands to reduce carbon emission and to realize carbon neutrality by harvesting clean and abundant solar energy. Third-generation solar cells, such as organic and perovskite solar cells are all relying on a semiconducting thin-film active layer to harvest the solar energy. The microstructure within the active layer, in terms of crystal structure, orientation, grain size and nanophase separation degree, is known to be critical to the solar cell device performance.

Here, we will present our recent studies on the process-structure-device correlation of organic and perovskite solar cells. In these studies, state-of-art grazing incidence scattering techniques using X-rays and neutrons were employed for various purposes, such as grazing incidence wide-angle/small-angle X-ray scattering (GIWAXS/GISAXS), grazing incidence transmission small-angle X-ray scattering (GTSAXS), grazing incidence neutron scattering (GISANS). These techniques can also be applied in material science, chemistry, biology and condensed matter physics studies. By modifying the wavelength of the probing beam and the experimental geometry, a variety of sample types, such as solutions, powders, surfaces and thin films, can be studied, covering wide length scales as well as versatile dynamic and kinetic behaviours.



Prof. Ying WANG

Assistant Professor
Department of Chemistry, Faculty of Science
The Chinese University of Hong Kong

Ying received her D.Phil degree in Electrochemistry from Oxford University in 2015. She continued her postdoc work on electrocatalysis and photoelectrocatalysis of CO₂ conversion at the University of Toronto and the University of North Carolina at Chapel Hill. In 2019, she joined the Department of Chemistry at the Chinese University of Hong Kong. Her research group focuses on the design of electrochemical systems and electrocatalysis for CO₂ conversion. She is the awardee of the National Excellent Young Scientists Fund (Hong Kong and Macau) in 2022.

Pathways towards carbon neutral chemical industries

In the past two centuries, the development of chemical industries has revolutionized the lifestyle of human society. While the first few waves of technologies have reshaped our daily life, the remaining challenge is finding the pathways of chemical strategy for sustainability. Traditional chemical industries apply intense energies for chemical reactions and release a sizable amount of greenhouse gases, such as carbon dioxide (CO₂). Thus, carbon capture and conversion technologies are critical in achieving the goal of carbon neutrality. We use water and electricity to turn waste CO₂ into chemical building blocks and liquid fuel under room temperature and atmospheric pressure. The current CO₂ conversion electrolyzers suffer from severe energy loss and carbon loss due to the inefficiency of the catalyst and reactor. We designed a new catalyst and advanced electrolyzer to use electricity and carbon efficiently. Our current design can improve carbon usage by more than ten times under industrial relevant conditions than the previous system. Ethylene, the world's most used chemical with various products from plastic to polymers, is one of the major products produced from our CO₂ conversion electrolyzers. The decarbonization of the production of ethylene or other chemical building blocks can lead to the production of chemicals with low-carbon footprints.

ELEVATOR PITCH COMPETITION

About the Competition

The name Elevation Pitch Competition comes from the notion that a short summary of the business ideas and innovative solutions should be delivered in the short time period of an elevator ride. In this challenge, your objective is to win an investor's heart to "invest" in your company.

Award

- Champion
- First Runner-up
- Second Runner-up
- Most Innovative Technology Award

Judging Criteria



Clarity & Completion of Pitch



Value of the Addressable Market



Value Proposition & Competitive Advantage of Product Offering



Go-to-market Strategy & Revenue Model



Quality of Team

Judging Panel



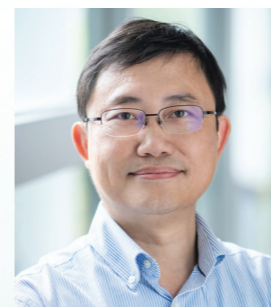
Dr. Gordon YEN
Founding Managing Partner
Radiant Tech Ventures Ltd.

Dr. Gordon Yen is the Managing Partner and licensed Responsible Officer (CE No. ABF837) of Radiant under the Hong Kong Securities and Futures Ordinance (SFO) for Type 9 (asset management) regulated activity with over 25 years of operational and board level experience in private and listed companies involving cross-border investments, global supply chain, offshore manufacturing and infrastructure businesses. He has been involved in innovation and technology venture investments since the late 1990s through managing corporate and venture capital fund investments as well as investments as angel investor in transactions involving startups from Israel, Greater China and North America. He is currently the Non-executive Vice Chairman and Non-executive Director of Fountain Set (Holdings) Limited (SEHK: 0420), an Independent Non-executive Director and Chairman of Sustainability Committee of Impro Precision Industries Limited (HKEX:1286), an Independent Non-executive Director of Asia Allied Infrastructure Holdings Limited (HKEX:711), the Chairman of the Hong Kong Business Angel Network and has previously served as Independent Non-Executive Director of Hopewell Holdings Limited and Hopewell Highway Infrastructure Limited as well as Director of GS1 Kong Kong. He graduated magna cum laude from Boston University with a BSc degree in Manufacturing Engineering and obtained an MBA from McGill University and a DBA from the Hong Kong Polytechnic University.

Alastair Louey is a venture partner of TigerJade Pebble Accelerator. He is also the Managing Director and Co-founder of REN Studios. After receiving his PhD in Biochemistry from Oxford University, he was a Business Development Consultant at Elpiscience, where he helped with licensing deals and with their series B funding round. Additionally, he has had experience working in venture capital (Lilly Asia Ventures), and private equity (Lake Bleu Capital).



Dr. Alastair LOUEY
Venture Partner
Tiger Jade Pebble Accelerator



Prof. Benny ZEE
Director
Office of Research and Knowledge Transfer Services
The Chinese University of Hong Kong

Professor Benny Zee is Director, Office of Research and Knowledge Transfer Services (ORKTS) of the Chinese University of Hong Kong (CUHK). He is also Professor and Director of the Centre for Clinical Research and Biostatistics (CCRB) of the Jockey Club School of Public Health and Primary Care, and Director of Clinical Trials and Biostatistics Lab in the CU Shenzhen Research Institute (SZRI). He holds honorary appointments in the Department of Clinical Oncology and the Department of Statistics of CUHK. He is also the Chairman of the Joint CUHK-NTEC Clinical Research Ethics Committee from 2006-2020.

Professor Zee obtained his Ph.D in Biostatistics from the University of Pittsburgh USA in 1987. He then joined the National Cancer Institute of Canada Clinical Trials Group as Senior Biostatistician, and faculty member in the Department of Community Health and Epidemiology and the Department of Mathematics and Statistics of Queen's University Canada from 1987-2001. He remains as Adjunct Professor with Queen's University after he joined CUHK and is actively promoting international academic activities and collaborations.

Jonathan Chee is the Chief Consultant to the Technology Start-up Support Scheme for Universities (TSSSU) and Pre-incubation (Pi) Start-ups in CUHK since 2015. He has over 30 years of experience in early-stage to late-stage investments, invested and built/grew over 200 companies with many successful exits.



Mr. Jonathan CHEE
Head of Venture Acceleration Team
Office of Research and Knowledge Transfer Services
The Chinese University of Hong Kong

EXHIBITION BOOTHS: CUHK InnoHK CENTRES

Microbiota I-Center

Booth 1

Prof. Francis CHAN / Prof. Siew Chien NG

Biotechnology



Microbiota I-Center (MagiC) harnesses and translates the human microbiome into cutting-edge innovations for early disease detection and prevention. We focus on advancing science in the gut microbiome and promoting entrepreneurship.

MagiC is committed to developing novel classes of microbiome diagnostics and live biotherapeutics for common diseases including obesity, cancer, autism, inflammatory disorders, and COVID-19, that will not only transform the lives of patients and their families but also accelerate Hong Kong into a world-class microbiome biotechnology hub.

www.magic-inno.hk

Centre for Novostics

Booth 2

Prof. Dennis LO

Biotechnology



The Centre for Novostics (Novostics), with the meaning of novel diagnostics, aims to push forward the frontier of molecular diagnostics. Novostics will focus on the development of cutting edge diagnostics based on cell-free nucleic acids in blood and other bodily fluids, particularly around prenatal diagnosis and cancer diagnostics. With the experience in developing prenatal testing of fetal chromosome disorders, the centre plans to extend the work to single gene disease and other pregnancy-associated conditions. A combination of genomic, epigenomic, transcriptomic and fragmentomic technologies will be employed to tackle bottlenecks in cancer diagnostics and investigate the tissue origin of malignancy by cell-free nucleic acid analysis, particularly for cancer types prevalent in Hong Kong, mainland China and Asia. These research areas will accelerate the application of liquid biopsy and promote Hong Kong as a leading molecular diagnostic centre in the world.

<https://novostics.hk/>

Center for Neuromusculoskeletal Restorative Medicine

Booth 3

Prof. Patrick YUNG / Prof. Woody CHAN

Health Technology



The Center for Neuromusculoskeletal Restorative Medicine has been established to advance biomedical research and development related to neuromusculoskeletal medicine. Combining the expertise in stem cells, biomaterials, 3D bioprinting, tissue engineering, and personalised and translational medicine of The Chinese University of Hong Kong and Sweden's Karolinska Institutet, the Center is devoted to restoring structure and function to injured, diseased and degenerated (due to ageing or trauma) neuromusculoskeletal tissues and organs. This multi-disciplinary, international consortium aims to apply convergent principles and technologies of biomedical science and engineering to ultimately address mobility impairments and improve patients' overall well-being.

Building on the talent and infrastructural research capabilities of CUHK and the research setup of the KI Hong Kong Ming Wai Lau Centre (MWLC) for Reparative Medicine in HKSTP, CNRM gathers multi-disciplinary investigators to lead projects across its five research programmes:

- Stem Cells and Cell-Based Therapies
- Tissue Engineering and 3D Microtissue Modeling
- Cellular and Molecular Mechanisms
- Preclinical and Clinical Translation
- Enabling Technologies

www.cnrm.com.hk

Multi-Scale Medical Robotics Center

Booth 4

Prof. Samuel AU / Prof. Philip CHIU

Robotics



Through funding support of the HKSAR Government, the Multi-Scale Medical Robotics Center (MRC) was established in April 2020 by the Faculty of Medicine and the Faculty of Engineering of CUHK in collaboration with ETH Zürich, Imperial College London, Johns Hopkins University and The University of Hong Kong.

The MRC laboratory is positioned to enable translational research and productisation of novel surgical robotic technologies, through the R&D programmes of Endoluminal Multiscale Robotic Platforms for Diagnostics and Therapeutics, Magnetic-guided Endoluminal Robotic Platform, and Imaged-Guided Robotics Intervention. The Hybrid Operating Room of the MRC Lab, equipped with MRI and Robotic-Assisted C-Arm X-ray Imaging System (Artis Zeego) machines, enables real-time, intra-operational medical imaging during surgical robotics interventions R&D, which is a one-of-its-kind facility in Asia that is fully dedicated to R&D and preclinical evaluations of new surgical robots and medical devices via live animal and cadaveric studies.

MRC is well connected with industry, and serves as a synergistic platform for clinicians, engineers, and researchers from local and overseas top-rank universities to contribute their efforts through transdisciplinary collaborations, to enable the acceleration of new IP generations, pre-clinical evaluations and the commercialisation of novel surgical robots, and to ultimately benefit patients and communities worldwide.

<https://www.mrc-cuhk.com>

EXHIBITION BOOTHS: CUHK InnoHK CENTRES

Centre for Perceptual and Interactive Intelligence (CPII) Ltd

Booth 5

Prof. Helen MENG

Artificial Intelligence (AI)



Centre for Perceptual and Interactive Intelligence (CPII) has been established by The Chinese University of Hong Kong (CUHK) in 2020. Centre Director Professor Helen Meng and the Principal investigators have rich backgrounds in computer vision, multilingual speech and language technologies, natural language processing, and AI-enabled design automation. To realise the promise of AI and achieve transformative benefits for our society, CPII is running research programmes covering Visual Intelligence as well as Speech & Language Intelligence and develops applications for Vision- and Language- based Healthcare AI, Vision-based Urban Services, and AI-Enabled Design and Automation. CPII will leverage Hong Kong's international research networks for AI talent development and exchange, nurture AI start-ups with our collaborators including MIT and UoM to bring academic outcomes to meet industrial demands together.

<https://www.cpii.hk/>

The Hong Kong Centre for Logistics Robotics

Booth 6

Prof. Yunhui LIU

Robotics
Artificial Intelligence (AI)
Logistics and Supply Chain Management



HKCLR was founded with the aspiration of becoming a world-class R&D centre for logistics robotics, setting a new scene for the "future workplace" for logistics professionals by developing innovative solutions for the industry's challenges through innovative robotics technologies.

<https://www.hkclr.hk/>

EXHIBITION BOOTHS: CUHK TECHNOLOGY STARTUPS

Beth Bioinformatics Co., Limited

Booth 1

Prof. Maggie Haitian WANG

Biotechnology



Beth Bioinformatics (BethBio) is a biotech company that develops state-of-the-art technologies to empower the development of new and better vaccines. Utilizing virology, AI and computational biology, BethBio provides a series of innovating bioinformatics solutions to pharmaceutical companies, including virus evolution prediction, candidate vaccine strain selection, optimized antigen design, vaccine effectiveness (VE) estimation in-silico, clinical trial design, codon optimization / deoptimization and more.

One of BethBio's signature technology is accurate prediction of virus evolution, developed using viral genome analysis and bioinformatics modeling and applicable to many viruses including SARS-CoV-2, Influenza and more. With it, BethBio is able to develop better vaccine candidates that are more resilient against future viral mutations and would provide better protection against circulating viruses for their clients.

These solutions could help our clients solve various technical difficulties such as protein expression, increase VE or manufacture efficiency of their vaccines, and improve chances of obtaining regulatory approval. For instance, from study results, BethBio's solutions are able to improve the VE of seasonal influenza vaccines by around 20%.

BethBio's technologies are applicable to every vaccine platform, meaning we could serve all kinds of clients. The company is already working closely with pharmaceutical companies, including several new vaccine co-development projects.

www.bethbio.com

GenieBiome Limited

Booth 2

Prof. Siew Chien NG

Biotechnology



GenieBiome, a biotechnology spinout from The Chinese University of Hong Kong was founded by world-renowned clinician-scientists and supported by a multidisciplinary team of experts in microbiology, metagenomics, bioinformatics, disease biomarkers, food technology, clinical trials, IP development and commercialization. For over a decade, our team has pioneered the use of microbiome with evidence-based science to tackle a myriad of diseases, including novel virus, gut serious illness, overweight and metabolic syndrome, skin irritation and mental health.

Our precision portfolio of G-NiiB includes diagnostic and risk prediction tests, next-generation microbiome precision formula, and precision medicine tailored for the Asian population.

We use our unique metagenomics database to identify novel microbes as diagnostic tools and generate personalised therapy for conditions with unmet needs (Microbiome Precision). We offer tailored-made microbial replacement therapy to restore imbalance in gut microbes to improve health outcomes and prevent diseases.

We pursue infinite innovations that is beyond our imaginations, and to achieve the mission impossible. G-NiiB is building the world's largest Microbiome Asian Big data to fulfil our mission to provide evidence based targeted solutions for the healthy future of the Next Generations.

www.g-niib.com

EXHIBITION BOOTHS: CUHK TECHNOLOGY STARTUPS

Luquos Energy Limited

Booth 3

Prof. Yi-Chun LU

Energy Technology
Clean Technology



Luquos Energy focuses on innovation of advanced battery technology, providing inherently safe, low-cost, and eco-friendly energy storage systems. The team was founded in Hong Kong in 2020, led by Prof. Yi-Chun Lu, Professor in Mechanical and Automation Department of CUHK. The company was admitted into the incubation program at HKSTP and The Chinese University of Hong Kong.

Luquos Energy focuses on core material technologies in batteries. The flow battery uses earth-abundant active materials and aqueous electrolytes for energy storage, which is low-cost, inherently safe, and eco-friendly. With the new ion-exchange membrane developed by the team, cross-over contamination in the flow battery is eliminated, dramatically improving the flow battery's lifetime. During the charge-discharge cycling test, the battery shows no decay after 3000 cycles, with an estimated cycle life of over 15 years.

Based on this technology, the team has developed a flow battery prototype with a designed power scale of 300W. The team is currently developing a kW-scale flow battery prototype, which can be potentially used in fields of renewable energy storage, uninterruptable power source, smart microgrid, electric vehicle charge, etc.

<https://www.luquosenergy.com/>

O-Spheres Limited

Booth 4

Prof. To NGAI

Materials Science



With our science-informed and evidence-based researches, we offer tailor-made preparatory methods to manufacture sophisticated eco-("polymer free shell") hollow particles with precisely controlled physical properties, such as shell thickness, permeability, mechanical strength and biocompatibility, etc.

With the innovative hollow microsphere technology, O-Spheres is committed to holding the value of the United Nations "Sustainable Development Goals (SDGs)", aiming to alleviate the microplastics issue and improve environmental protection with innovations.

Our core technology has been successfully applied on the white ink printing and with the potential to serve as hollow mineral-based UV filters in personal care products. We also offer consultancy services to develop eco-friendly alternatives for your products. The propelling demand for hollow microspheres in global market potentiates the development of hollow microsphere-based products and expands the potential applications.

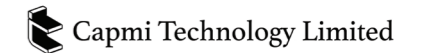
<https://o-spheres.com/>

Capmi Technology Limited

Booth 5

Prof. Pheng Ann HENG

Health Technology



Capmi is a dedicated team of visionary engineers and scientists united by one goal - to redefine the motion capture paradigm, by creating innovative, affordable, and accessible motion capture products. With Capmi motion capture technology, we bring advanced technology to the market at a consumer-level price.

Capmi pushes the boundaries of advanced motion tracking by precisely capturing, processing, and sharing human movement data, and empowering the professions of sports, healthcare, and other industries with pioneering technology.

www.capmitech.com

CUBE Robotics Limited

Booth 6

Prof. Darwin Tat Ming LAU

Robotics



CUBE aims at enabling lower cost, more efficient, more precise, faster, and safer construction processes with the aid of innovative robotic technologies, in particular parallel cable robotics. Our first contribution to the construction industry is the development of a suspended robotic system for façade inspection of aged buildings. With our core technologies developed, our robotic system can minimize the inspection blind spot and adapt to various features of the building. The case study demonstrates significant reduction in operation time and costs respectively, compared with conventional approaches. Safety of the workers and the general public can be further enhanced, by circumventing the needs of working at height and higher inspection quality. Data retrieved can also be useful for big data analysis, enabling predictive maintenance and smarter urban planning.

<https://www.linkedin.com/company/cube-robotics-limited/>

EXHIBITION BOOTHS: CUHK TECHNOLOGY STARTUPS

DepthVision Limited

Booth 7

Prof. Yunhui LIU

Electronics

DepthVision Limited

DepthVision is a company that focuses on innovative 3D vision technology. The company develops and commercializes ultra high-speed and high-accuracy 3D imaging sensors based on the self-developed smart CMOS imaging chips (5k-40kfps, 4-million pixels). The products aim to solve the critical problems, i.e. low speed, low resolution, low accuracy, high cost of existing 3D products. Our 3D imaging sensors can acquire point-clouds 5-40 times faster than existing systems. Therefore, the product inspection can be performed 5-40 times faster using our sensors. The products have many potential applications in product inspection in manufacturing industry, self-driving and safety systems in automobiles, 3D sensing and perception of robots, human-robot interaction (metaverse, etc.), etc. The research team is composed of professors, experts, postdocs, PhD students and engineers with extensive experiences in relevant industry.

Golden Biotech Limited

Booth 8

Prof. Yangchao CHEN

Biotechnology



Golden Biotech was founded by Professor with expertise in RNA technology and cancer biology from Faculty of Medicine, CUHK. The company is aiming at the development of innovative RNA therapeutics for unmet medical needs such as cancer. Another technology platform built up by the company is drug delivery systems based on exosomes from various sources. We established membrane infiltration based technology platform for large-scale isolation and purification of exosomes from various sources including cow milk, wolfberry and human cells. We established technology platforms to encapsulate various drugs including small molecules, peptides, siRNAs, microRNAs and mRNAs into exosome at high efficiency. We established HTP microRNA drug screening technology platform and identified a small molecule modulator of a microRNA as potential anti-cancer agent.

Hopebotics Limited

Booth 9

Prof. Zheng LI

Robotics



Hopebotics Limited is a young start-up company founded in Hong Kong by members of the Department of Biomedical Engineering and Department of Surgery of the Chinese University of Hong Kong. We are committed to establish a platform integrated with soft wearable robotics technology that can provide rehabilitation, daily living assistance, and social functionalities to improve the quality of life of the elderly and disabled population.

<https://www.hopebotics.org>

Illuminatio Medical Technology Limited

Booth 10

Prof. Weitian CHEN

Health Technology



Chronic liver disease (CLD) is a pandemic healthcare problem affecting about 1.5 billion people worldwide. Diagnosis of liver fibrosis plays a key role in the clinical management of patients with CLD. The current gold standard for diagnosis of liver fibrosis is liver biopsy, which is invasive, costly, and unsuitable for screening and treatment monitoring. The existing non-invasive methods still have significant limitations to diagnose liver fibrosis.

Based on our research outcome at CUHK, our company aims to commercialize a non-invasive diagnostic technology to detect biochemical symptoms of diseases before any anatomical symptoms manifest. The technology has potential to be used for early diagnosis and treatment monitoring of diseases. A main goal of our company is to apply this technology for diagnosis of liver fibrosis and a comprehensive assessment of CLD.

www.imt.hk

EXHIBITION BOOTHS: CUHK TECHNOLOGY STARTUPS

LaSense Technology Limited

Booth 11

Prof. Wei REN

Green Technology
Environmental Technology



LaSense is a laser gas sensing technology company that self-develops and manufactures ultra-sensitive gas sensors, based on core technologies including state-of-the-art tunable diode laser absorption spectroscopy (TDLAS), quartz-enhanced photoacoustic spectroscopy (QEPAS) and a wide range of enhanced sensing techniques that can be selected based on customer's need. The company's products focus on precise quantification of greenhouse gas concentration and real-time online monitoring of gas pollutants, to deliver customers with accurate and reliable gas concentration data at unprecedented speed.

LaSense's precise gas sensing solution aims to contribute to a safer, smarter and livable city, while setting up new benchmarks for China-made measuring instruments under the global goal of achieving "Carbon Peak and Carbon Neutrality".

www.lasensetech.com

MicroMag Healthcare Limited

Booth 12

Prof. Li ZHANG

Biotechnology



MicroMag Healthcare is a start-up from the Department of Mechanical and Automation Engineering in CUHK and is receiving support from the Incu-Bio Programme from the Hong Kong Science Park.

In the 21st century, infectious diseases are still burdening our society and cause more than 20,000 lives lost daily. Early detection is essential for timely treatment and prevention. Existing diagnostic methods face limitations in long reaction time, high costs, or require specialists to conduct labour-intensive procedures.

MicroMag is dedicated to weaving engineering research and medical applications together. In particular, we focus on preventing infectious outbreaks and saving lives by providing instant, easy and accurate diagnoses through our innovative microrobotic technology.

<https://micromaghealthcare.com/>

Precision Cut Limited

Booth 13

Prof. Shih-Chi CHEN

Biotechnology



Precision Cut Limited is founded by a team of experts in precision engineering and biomedical engineering from the Chinese University of Hong Kong. We are dedicated to developing solutions of precision tissue sectioning and cutting via various technologies. The proposed product is the ultrafast oscillating blade microtome for precision tissue sectioning.

The microtomy is a standard technique for almost all pathology and microscopy laboratories, which belongs to the market of biological specimen preparation. The development of new imaging and tissue processing techniques necessitates a new class of microtome to slice ultrasoft tissues, fresh tissues and fixed whole organs into thin sections for microscopic imaging. The new microtome developed by Precision Cut enables the precise sectioning of various ultrasoft tissues that are hard to process before.

The new microtome successfully addresses the existing challenges for the commercial products that the highest blade oscillating frequency (up to 350 Hz) and minimal error motion (< 1 μm) ensure excellent cutting capability. The new microtome enables many emerging imaging and biological applications, such as high-throughput super-resolution imaging and tumor slice drug screening, and potentially generates great commercial value in the fields of pathology and biophotonics.

Targene Biotech (Hong Kong) Limited

Booth 14

Prof. Jiankun XU

Biotechnology



Targene focused on tissue targeting adeno-associated virus (AAV) and customized targeting plasmid research and development with a starting of cartilage targeting AAV. Our short-term objectives are scientific study service and license out based on our current products. We also aimed at exploring the potential application of tissue targeting AAV in gene therapy by pre-clinical and clinical trials as our long period objectives. Targene aims to provide tissue targeting recombinant AAV by direct evolution technology to solve the lack of targeting of the wild type AAV. Our current customers are bone and joint laboratories in Hong Kong, China mainland and overseas. We also provide license out service to other friendly companies to broaden our market. And by collaborating with clinicians, our future potential customers will be certain patients that need gene therapy.

EXHIBITION BOOTHS: CUHK TECHNOLOGY STARTUPS

ThingX Technologies Limited

Booth 15

Mr. Zhiyuan XIE

Artificial Intelligence (AI)



Founded by researchers from CUHK, ThingX Technologies Limited aims to become a world's leading provider of embedded AI technologies and to empower IoT devices with one-stop AI solutions. ThingX focuses on the key trigger points of current embedded AI market, such as the lack of intelligence, reliability, and privacy protection features, etc. With the advanced embedded AI technologies, ThingX will provide the game-changing embedded AI solutions in several critical fields including smart health, autonomous driving, and IoT, improving quality of life and well-being for all individuals.

<http://thingx-tech.com/>

TiFi Technologies Limited

Booth 16

Prof. Soung Chang LIEW

Communications Technology



TiFi aspires to become a leading provider of cutting-edge wireless technologies and products for industrial usage within five years. The team members have an aggregate of more than 60 person-years of R&D experience in wireless communication technology.

Today's mission-critical machines in factories and logistic warehouses are predominantly interconnected by wired networks. In the coming age of Industry 4.0, many new industrial applications call for tetherless, mobile, and adaptive connectivity between machines that can only be provided by wireless networks.

Today's wireless networks, however, are unreliable due to radio frequency interference and signal blockage by objects. Furthermore, many mission-critical industrial operations and processes call for end-to-end communication latency between machines in the regime of milliseconds and sub-milliseconds that is beyond the reach of today's wireless networks.

TiFi provides technologies and products that enable reliable time-sensitive wireless networks, a key component for a wide range of Industrial 4.0 applications.

Ynno Med Limited

Booth 17

Prof. Xiao YANG

Biotechnology



Ynno Med Limited established a platform for the discovery and development of novel drugs, using computer-assisted technology to aid in the identification of unique drug targets, rational drug design, hit screening, lead optimisation, biological evaluation, pharmacological and toxicity assessment. The use of computer-assisted technology allows us to increase rate of success, streamline the discovery process and significantly reduce costs in pre-clinical stages of drug R&D. Deployment of this technology has resulted in our successful identification of several promising first-in-class antimicrobial drug candidates. We also work on hit compound identification for other areas of biomedical research. By accelerating the R&D efforts of both academia and the pharmaceutical industry, our products are expected to enrich the future drug market.

<http://ynnomed.com/>

CHINA ENGAGEMENT OFFICE, CUHK

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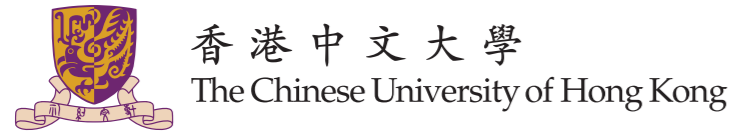


The Chinese University of Hong Kong (CUHK) has been enthusiastic about establishing close connections and productive partnerships with the top universities and research organizations in China to carry out diversified and multilateral projects covering research collaborations, student and faculty exchange, academic activities, joint education programmes, along with research and education bases. The rising prominence of the country and the opportunities brought by rapid regional development have increasingly recognized the importance of our collaborative efforts and strategic initiatives. The University will continue to integrate engagement platforms to leverage the unique strength of Hong Kong, contributing to national and global development. The China Engagement Office (CEO) serves as a bridge between CUHK and institutions in Mainland China, Taiwan and Macao to forge academic exchanges and research collaborations in support of CUHK's vision to be acknowledged locally, nationally and internationally as a first-class comprehensive research university.

<https://www.cneo.cuhk.edu.hk/en/>

ACKNOWLEDGEMENT

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