Organizers

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Supporting Organization

HKUST ENTREPRENEURSHIP CENTER 香港科技大學創業中心

HKUST DeepTech Top Talent Matching
港科大深科技高才交流会

26 March 2024, Tuesday | 10:00-16:00

AGENDA 议程

09:30-10:00	Registration 登记
10:00-10:20	Opening & Introduction 开幕及介绍
10:20-12:30	Interactive Talent Matching 互动人才配对环节
12:45-14:30	Networking & Lunch 交流环节及午餐
14:30-16:00	Free Activities 自由活动

About the HKUST Deeptech Talent Matching

Co-organized by HKUST Office of Knowledge Transfer and the Hong Kong Top Talent Services Association (HKTTSA), this talent matching event aims to bring together the brightest minds in the field of DeepTech and facilitate talent recruitment and collaboration opportunities between HKUST research projects and top talented individuals under the Top Talent Pass Scheme (高端人才通行證計劃).

Organisers

Hon. Hailong SHANG
Member of the Legislative Council;
Founding Chairman of Hong Kong Top Talent Services Association

Prof. Zexiang LI
Professor, Department of Electronic & Computer Engineering, HKUST;
Co-founder of Hong Kong X;
Founder of XbotPark

Prof. Tim CHENG
Vice-President for Research and Development, HKUST

Special Guests

Dr. Ming GE
Commissioner for Industry (Innovation and Technology)
Innovation, Technology and Industry Bureau

Hon Duncan CHIU
Member of the Legislative Council

Prof. Fumin ZHANG
Director of Cheng Kar-Shun Robotics Institute;
Chair Professor, Department of Electronic and Computer Engineering;
Chair Professor, Department of Mechanical and Aerospace Engineering

Mr. Terence Yau
Executive Vice Chairman of Hong Kong Top Talent Services Association;
Director of C M Wong & Associates Limited

HKUST Deeptech Projects

Bio-Medical and Healthcare (BMH)

Prof. Amy Kit Yu FU
Research Professor, Division of Life Science

About the project: sST2 – Novel Therapeutic Target for Alzheimer's Disease
sST2, a decoy receptor of interleukin-33-ST2 signaling, is a new disease-causing factor and novel therapeutic target for Alzheimer's diseases.

Key Technology Edges:

- **Novel therapeutic target:** increased sST2 level is associated with more severe pathological changes in female individuals with Alzheimer's disease
- **Solid human data support**: Mendelian randomization analysis revealed that decreased sST2 levels lower AD risk and endophenotypes in ApoE4 females
- **Accumulated research and extensive data:** activation of interleukin-33–ST2 signalling ameliorates Alzheimer's disease-like pathology and cognitive decline

Prof. Chun LIANG
Associate Professor, Division of Life Science

About the project: A Revolutionary Approach to Develop Innovative Anticancer Drugs Targeting DNA Replication-Initiation Proteins
Our platform targets cancer's pre-RC proteins with DRIPs inhibitors, offering a transformative approach for various cancers and precancerous conditions, with potential in CGT and neurodegeneration. EN002 and EK4-106 show preclinical success; EN002-gel is Phase II-ready after a successful Phase I, highlighting our solution's market promise.

Key Technology Edges:

- **Broad Application:** Pioneering treatments for a wide array of cancers and precancerous lesions, with implications for CGT and neurodegenerative diseases.
- **Competitive Advantage:** Exceptional potency and safety, offering significant improvements over current cancer therapies.
- **Commercial Progress:** Successful Phase I clinical trials and forthcoming Phase II, signalling rapid progress towards market entry.

Prof. Xiaomeng LI
Assistant Professor, Department of Electronic and Computer Engineering
Associate Director of Center for Medical Imaging and Analysis

Research Interest:

- Medical image analysis
- Deep learning
- Computer vision

Prof. Karl Wah Keung TSIM
Chair Professor, Division of Life Science

About the project: Development of Anti-Angiogenic Eyedrop for Eye Disease
Therapeutic potential of resveratrol, polydatin and/or its analogues for eyedrop against age-related macular degeneration (AMD) by angiogenic inhibition

Key Technology Edges:

- Solid foundation and clinical applications of VEGF-targeted drugs from traditional Chinese medicines (TCMs) [7 publications and 1 Chinese patent]
- Phytochemicals targeting VEGF with easy administration with low-cost manufacturing, long-term administration and easy topical instillation
- New therapeutic and non-invasiveness strategy over standard treatment options such as argon laser photocoagulation and photodynamic therapy

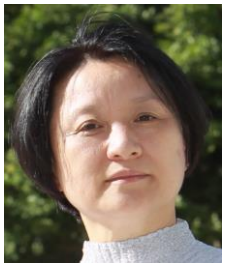
Prof. Terence Tsz Wai WONG
Assistant Professor, Department of Chemical and Biological Engineering

About the project: AI-enabled medical imaging for next-gen histological imaging
CHAMP (Computational High-throughput Autofluorescence Microscopy by Pattern Illumination) is a transformative diagnostic tool that revolutionizes histological imaging by providing rapid, preparation-free cancer imaging. Leveraging autofluorescence and UV light, it generates high-contrast images that traditionally require chemical staining, but without altering the sample. This

innovative technology employs a low-magnification lens coupled with pattern illumination, a method that mathematically restores resolution lost at lower magnifications, enabling quick, extensive area imaging without losing detail.

Key Technology Edges:

- **Rapid Results:** CHAMP is expected to deliver clinical gold standard images within 3 minutes compared to 3 days for the current clinical method.
- **Intraoperative Utility**: CHAMP offers rapid, stain-free and preparation-free, thick tissue histological imaging suitable even during surgery.
- **Versatile Application**: CHAMP ,unlike current intraoperative method, is applicable to nearly all biological tissues with primary focus on lung and breast cancer.

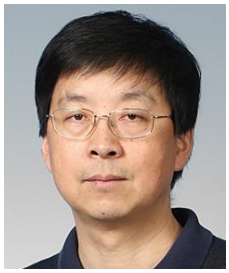


Prof. Hannah H XUE
Professor Emeritus

About the project: DMCC: An Environmental Friendly API Purification System
A highly scalable and environmentally friendly platform technology for purification of active pharmaceutical ingredients and commercially valuable chemicals

Key Technology Edges:

- A breakthrough platform technology with patent protections, for effective purification of commercially valuable chemicals
- Unprecedented scalability for purification of chemical materials at industrial scales unachievable with any existing technologies
- Both user and environmentally friendly, with no solid waste and no irreversible material loss, commonly occurred using competitive technologies

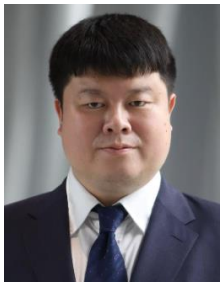


Prof. Guang ZHU
Professor, Division of Life Science

Research Interest:

- Structural biology
- Deoxyribonucleic acid (DNA) replication
- Cancer
- Chemical biology
- Cellular and molecular mechanisms

Material, Energy, and Sustainability (MES)



Dr. Shuyu CHEN
Director, Acoustic Metamaterials Group Ltd.

About the project: Acoustic Metamaterials: Next-generation noise control and audio solution
Coupling applied physics with intelligent design, the acoustic metamaterials finely construct tiny artificial structures to achieve optimal noise absorption performance.

Key Technology Edges:

- Low frequency noise absorption capabilities covering broadband frequency as well.
- Customization of absorption spectrum
- High-efficiency noise absorption while maintaining High ventilation.

Dr. Guan DAO
Ph.D. in Civil and Environmental Engineering;
Certified in ESG Investing (CFA)

About the project: SANI® Process - A Paradigm-Shift Sewage Treatment Technology with a 70% Reduction of Sludge
SANI® process was developed for the removal of organics and nitrogen with sludge minimization in the treatment of saline sewage generated from seawater used for toilet flushing or salt water intrusion.

Key Technology Edges:

- Reduces 60%-70% of biological sludge production
- Saves 30%-40% of space
- Saves 20%-30% of energy consumption and CO2 emission

Prof. Furong GAO
Chair Professor, Department of Chemical and Biological Engineering

About the project: Smart Polymer Processing Plant (S-P^3) - Open Collaborative Intelligent Platform

The next-generation intelligent injection molding with real-time material and quality monitoring using breakthrough sensors, award-winning control algorithms for superior precision, and a dedicated big-data system for intelligent collaboration.

Key Technology Edges:

- Breakthrough and world first sensor for capturing material and quality changes on line
- Award winning control algorithms for superior precision for injection molding
- Dedicated big-data open system for collaborative intelligent molding

Prof. Wei HAN
Research Associate Professor, Division of Environment and Sustainability

About the project: Smart EcoClean Matrix

Excessive algal growth poses serious environmental health problems, yet the development of a cost-effective solution for long-term inhibition of algal growth remains a huge challenge. This invention utilizes algicidal hydrogels comprising safe and environmentally friendly bioactive ingredients for practical applications in fresh water and sea water. The hydrogels can release oxidizing and cell-permeable algicides in a controlled manner to inhibit algal growth for a long time without adverse effects on aquatic organisms. Their controlled release performances and algicidal activities have been verified in laboratories and a 1500 m3 sea water reservoir at Hong Kong. Real-time monitoring equipment effectively provides data to adjust the amount of hydrogel and perform daily water quality testing.

Key Technology Edges:

- 3D structural hydrogel with environmental friendly ingredients achieve slow release effect
- Long term effect can constantly affect algae growth in the water body Without pollutant introduce to the natural water body
- Intelligently and dynamically adjusted to control the concentration of microorganisms and microalgae in the water body within a safe range for a long time

Prof. Baoling HUANG
Professor, Department of Mechanical and Aerospace Engineering

About the project: A Solar Control Film for Glass Window, that blocks heat and UV while maintaining high visibility and RF/WiFi transmission
This innovative film effectively moderates the environment to a pleasant temperature by selectively dealing with the solar light and infrared of different spectra and filtering out undesired radiation. Several cooling films for glass windows have been developed for cars, trains and buildings, tailor-designed according to their application scenarios.

Key Technology Edges:

- Effective cooling and comfort: it can block over 80% of near infrared solar energy and the majority of UV exposure
- High visibility: it can achieve similar visual comfort as other Low-E films, by our developed micron-scale manufacturing techniques
- Super-high transmission of microwave (WiFi/RF) for communication: it can significantly reduce film electromagnetic shielding effects, by our novel techniques

Prof. Moez LOUATI
Research Associate Professor, Department of Civil and Environmental Engineering

About the project: Time-reversal diagnostic for the Health Monitoring of Pressurized Pipelines
The time-reversal diagnostic technology enables a quick and non-disruptive way to identify diverse and multiple defects in pipelines including drainage and potable water mains.

Key Technology Edges:

- The technology uses fast-traveling waves for rapid diagnostic testing, around 1000 times faster than roving sensors
- The TR methodology is non-disruptive and non-intrusive, eliminating service interruption, isolation of mains, and contamination risks
- The technology offers controllable localization resolution and allows for the development of automated and autonomous processes

Prof. Yoonseob KIM
Assistant Professor, Department of Chemical and Biological Engineering

About the project: Revolutionizing Energy Storage: Tube transport-Inspired All-solid-state electrolytes for Li-based batteries
Composite all-solid-state electrolytes selectively transport Li+ rapidly and reliably. This technology can enable smaller and lighter Li-based rechargeable batteries.

Key Technology Edges:

- Our electrolytes' Li+ conductivity and transference number outperform liquid electrolytes and sulfides
- These all-solid-state electrolytes are fire-proof and economical in large-scale production
- Prototype coin cell, paired with Li metal anode and LCO cathode, shows a capacity of 150 mAh g-1

Dr. Raphael ZHOU
Chief Executive Officer, CoolStar Innovation Technology Limited

About the project: Green-House-Gas-free elastocaloric cooling/heating technology - Materials and Devices
By harvesting the unique phase transformation latent heat of shape memory alloys, the elastocaloric effect is utilized and developed into cooling/heating modules like fridges and air conditioners. This green technology revolutionizes the conventional refrigeration technology that has used harmful refrigerants for decades.

Key Technology Edges:
Compared with the conventional vapor-compression cooling, our elastocaloric cooling technology has the following advantages:

- Completely avoid the usage of greenhouse gas refrigerants; Use solid shape memory alloys instead
- Save electricity consumption and the related carbon emission by at least 10%
- The cooling core material (shape memory alloy) is a typical smart material and is 100% recyclable

Electronics, AI, and Smart Systems (EAS)

Dr. Xiao HUO
Principal Researcher, AI Chip Center for Emerging Smart System

About the project: Efficient Inference Accelerator for Large AI Model
We offer an inference accelerator designed for large-scale AI models, leveraging a cutting-edge application-algorithm-hardware co-design platform and state-of-the-art compute-in-memory technology. Our solution is specifically tailored to deliver highly efficient and power-optimized computing solutions for transformer-based models such as computer vision, bird eye view (BEV), large language models (LLMs) and AI-generated content (AIGC).

Key Technology Edges:

- Customized AI hardware design using application-algorithm-hardware co-design platform
- Digital Compute-In-Memory technology for high power efficiency AI computing
- Compression technology specifically designed for transformer-based large AI models

Prof. Fangzhen LIN
Professor, Department of Computer Science and Engineering
Program Director of MSc in Information Technology

About the project: Knowledge acquisition with LLMs; innovated small language model training, and integration of language models.

Research Interest:

- Artificial intelligence
- Programming languages
- Robotics
- Multi-agent systems
- Game theory and social choice theory

Prof. Haobo LIANG
Operation Director, Hong Kong Center for Construction Robotics

About the project: Building the Future: Harnessing Technology's Potential to Transform Construction

Combining AI, IoT, 5G technologies, and robotics, we are collaborating to develop cutting-edge robotics and automous systems for construction industries. Highlights include:
- Construction digitalization, enhancing efficiency, quality, and safety
- Construction IoT, driving connectivity and data-driven decision-making
- Construction robotics, revolutionizing processes and productivity
- Operational efficiency: Streamlining construction processes with the integration of robotics technology

Key Technology Edges:

- Expertise and Innovation: We have a team of experts with specialized knowledge and experience in the field of construction robotics. This expertise could enable us to develop innovative solutions that meet the specific needs of the construction industry
- Partnerships and Collaborations: We have already established partnerships and collaborations with industry stakeholders, such as construction companies and academic institutions. These partnerships could provide access to expertise and resources that could help us to develop and commercialize our products and services
- Customization and Flexibility: We offer customized solutions that are tailored to the specific needs of customers. By providing flexible solutions that can be adapted to different project requirements, we could establish a reputation for responsiveness and customer service, which could help to build loyalty and drive growth over time

Prof. Yajing SHEN
Associate Professor, Department of Electronic and Computer Engineering

About the project: Agile Executive Terminal for Robots

The development of a tactile sensor comparable to the human fingertip is of paramount importance for robotics. Our project team previously proposed a flexible tactile force sensing solution based on the Hallbach magnetic array in the top robotics journal Science Robotics. This technology achieved precise tactile feedback comparable to human fingertips for the first time, decoupling normal and tangential forces, achieving ultra-high resolution, and possessing characteristics such as small size and low cost. On this basis, we have conducted in-depth research development and technology iteration in terms of high-precision measurement of multi-dimensional forces, product durability and communication compatibility. It now has a foundation for industrialization and has applied for multiple patent protections.

Key Technology Edges:

- High resolution: This technology achieved precise tactile feedback comparable to human fingertips for the first time, decoupling normal and tangential forces, and achieving ultra-high resolution
- High dynamic: Through structural design and corresponding force decoupling algorithm, the sensor can achieve real-time highly dynamic force detection and feedback, greatly reducing the need for computing power
- Low cost: Our sensor is simple and suitable for mass manufacturing, and the cost and selling price are far lower than similar products with similar performance

Prof. Abhishek Kumar SRIVASTAVA
Associate Professor, Department of Electronic and Computer Engineering

About the project: Quantum rod LEDs for display and lighting with high quantum yield and tunable wavelength of emission

The technology offers a method for fabricating core shell/alloy quantum rods that can have tunable emission in the visible region of the spectrum, particular around green emission, allowing the maker to produce polarized emission, achieve high quantum yield and tunable wavelength of emission better than quantum dots.

Key Technology Edges:

- Using innovative quantum rod nanomaterial, we can create any desired light spectrum solving the main problems of LED illumination.
- Better thermal stability of QRs enables development of low-blue lighting LEDs with high color performance and efficacy.
- Applying of quantum material in on-chip configuration enables a new generation of QLED display with up to 40% less price and better performance.

Prof. Man Chun TSENG
Research Assistant Professor, Department of Electronic and Computer Engineering

About the project: Micro-second Response Ferroelectric Liquid Crystal (FLC) Light Modulator for Time-Sequential-Multiplexed 3D, Vivid-Color Display, and Wavelength Selective Switch (WSS)

Field-sequential high resolution displays with high refresh rates are in demand for emerging technologies such as VR, AR, naked-eye 3D, and HUD displays. To achieve a three-color RGB display, one pixel is divided into three small red, green, and blue pixels. Field-sequential display is a time-sequential multi-pixel multiplexing technology implemented through fast refresh in time sequence. Liquid crystal display technology has huge potential in the field of field sequential display, but it requires the response speed of the liquid crystal to be lower than 1 ms. Ferroelectric liquid crystal (FLC) has microsecond-level response speed and has attracted a lot of attention. DHFLC display technology is one of the most suitable display technologies for realizing high-resolution field-sequential display. Because of its fast response speed, voltage-controlled continuous grayscale, low operating voltage, and no edge field effect, DHFLC can support refresh speed within 2 kHz, high-resolution display with high pixel density.

Key Technology Edges:

- Compatible with existing production technology by testing on the G4.5 production line as a drop-in replacement of IPS LCD
- Self-developed and patented FLC materials that can achieve kg-level mass production
- Balanced electro-optical performance, fast response speed, high transmittance, low birefringence, large phase modulation depth

Prof. Hongyu YU
Associate Professor, Department of Mechanical and Aerospace Engineering

About the project: Haptic Sensors for Future Human-Robot Interaction

Our cutting-edge technology revolutionizes human-robot interaction by seamlessly integrating vision, RF, and haptic sensing functions. Highlights include:

- High-performance, cost-effective haptic sensor skin for humanoid robots
- Fusion of vision, RF, and haptic sensors for practical cooperation
- Robust tactile sensors for human-like manipulation.
- Embedded AI for understanding and enhancing social interaction between humans and robots

Key Technology Edges:

- A full body, flexible haptic sensor skin for humanoid robots with low cost and high performance
- Fusion of vision, RF, and haptic sensors for full-scale effective human-robot interaction and cooperation
- Robust tactile sensors for dexterous manipulation
- Embedded AI to understand the gathered information from the sensing system for future social interaction between humans and robots

Prof. Huan YIN

Research Assistant Professor, Department of Electronic and Computer Engineering

About the project: RoboBIM: Automated Building Inspection and Monitoring with Mobile Robots and BIM

Introduction:
Traditional building inspection and monitoring heavily depend on human expertise and manual efforts. In this project, we will develop a mobile robot platform for AI-powered building inspection and monitoring, focusing on building information modeling (BIM), robotic vision, and navigation.

Prof. Xiaofang ZHOU

Head and Chair Professor, Department of Computer Science and Engineering; Otto Poon Professor of Engineering

Research Area: Data, Knowledge and Information Management
Research Interests: Spatiotemporal and multimedia databases; Data mining; Data quality management; Big data analytics; Machine learning

Biography
Prof. Xiaofang Zhou is Otto Poon Professor of Engineering and Chair Professor of Computer Science and Engineering (CSE) at The Hong Kong University of Science and Technology (HKUST). He received his BSc and MSc degrees in Computer Science from Nanjing University in 1984 and 1987 respectively, and PhD in Computer Science from University of Queensland (UQ) in 1994. From 1994 to 1999, he worked as a Senior Research Scientist in Commonwealth Scientific and Industrial Research Organisation (CSIRO) in Australia, leading its Spatial Information Systems group. He joined University of Queensland in 1999 and became a Professor of Computer Science in 2004. From 2006 to 2020, he was Head of UQ Data and Knowledge Engineering (DKE) research group and Data Science discipline.

His research focus is to find effective and efficient solutions for managing, integrating, and analysing large-scale complex data for business, scientific and personal applications. He has been working in the area of spatiotemporal and multimedia databases, data mining, data quality management, big data analytics, and machine learning. He received the Best Paper Awards at WISE 2012&2013, ICDE 2015&2019, DASFAA 2016 and ADC 2019. He was a Program Committee Chair of IEEE International Conference on Data Engineering (ICDE 2013), ACM International Conference on Information and Knowledge Management (CIKM 2016), and International Conference on Very Large Databases (PVLDB 2020). He was a General Chair of ACM Multimedia Conference (MM 2015). He was the Chair of IEEE Technical Committee on Data Engineering from 2015-2018. Professor Zhou is a Fellow of IEEE.