College of Engineering
香港城市大學
City University of Hong Kong

Issue 51 (January 2024)

Faculty Achievement

College of Engineering

The College has achieved outstanding results at the 3rd Asia Exhibition of Innovations & Inventions Hong Kong (AEII).

The triumph of our members is a testament to our outstanding research capabilities, which were showcased throughout the event.

	Inventor(s)	Project
Special Prize – IFIA Award, and Gold with Congratulations of Jury Award		
1	Prof Michael TSE Dr DING Li	Negative Reactance: A Game Changing Device for Power Applications
Gold with Congratulations of Jury Award		
2	Prof LI Lishuai Mr ZHAO Weizun Mr CHARRUAUD Florent	ClusterAD: Method of Presenting Flight Data of an Aircraft and a Graphical User Interface for Use with the Same
Gold Award		
3	Prof Derrick JIANG Mr MA Tianlu Dr WEI Shusheng Prof LONG Teng (University of Cambridge)	Multi-Site Integrated Power Converters for DC Distribution Networks of Data Centers
4	S3Tough Tech Co. Limited (HK Tech 300)	Super-Tough Artificial Spider Silk
5	Seth Biotech Limited (HK Tech 300)	Three-dimensional Copper-based Filter with Fast Virus Elimination
Silver Award		
6	ASA Robotics Limited (HK Tech 300)	Luna Cat
7	Prof LY Thuc Hue Mr LIU Haijun Dr THI Quoc Huy	Ice Transfer for 2D Materials and Ultra-clean Semiconductor Device Manufacture
8	Prof Johnny HO Dr QUAN Quan Mr ZHANG Yuxuan Dr WANG Wei	Solar-Electrocatalytic System for Hydrogen Generation
9	Prof Vincent KO Ms CHUN Yuen Kiu Dr NG Chi On Dr XIAO Yelan	Selective Oil-absorbing Eco-Friendly Materials Developed by Simple Chemical Modification
10	Doctech HK Limited (HK Tech 300)	Nanotwinning-assisted Structurally Stable Copper for Fine-pitch Redistribution Layer in 2.5D/3D IC Packaging
11	ITsci Company Limited (HK Tech 300)	AIstain: AI Virtual Immunostaining for Diagnostic Pathology
12	NerOcean Limited (HK Tech 300)	A New Generation of Dissolved Oxygen Sensor Using Replaceable Photo-sensing Film
13	Srameak Insight Limited (HK Tech 300)	Wearable Noninvasive Cardiovascular Sensor
14	Super Bamboo Limited (HK Tech 300)	Super Bamboo: High Performance Non-toxic Low Embodied Carbon Engineered Bamboo Material
Bronze Award		
15	Micro Sensing and Imaging Technologies Limited (HK Tech 300)	Multispectral Tonoateriography Imaging Device and Method
16	Wearable Intelligent Sensing Technologies Limited (HK Tech 300)	A Tonoarteriography-based Close Loop Drug Delivery Device for the Monitoring and Therapy of Hypertension

Faculty Achievement

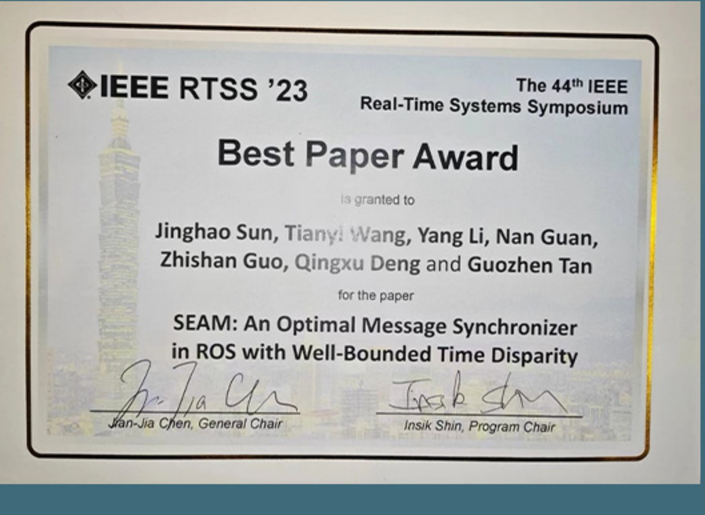
College of Engineering

Congratulations to the recipients of the NSFC/RGC Collaborative Research Scheme (CRS) and Joint Research Scheme (JRS) for 2023-24.

NSFC/RGC CRS	
HK Project Coordinator	**Project Title**
Prof Alex JEN	Integrated Material Design and Device Engineering to Overcome the Limits of Non-radiative Losses and Stability in Next-generation Organic Photovoltaics

NSFC/RGC JRS	
HK Principal Investigator	**Project Title**
Prof HUANG Gongsheng	Study on thermal environment mechanism and energy characteristics of high performance decoupled radiant cooling system using low temperature source
Prof JING Xingjian	Bio-inspired Anti-impact Compliant Capture and Attitude Takeover Control of Non-cooperative Spacecraft
Prof LIU Yingxia	Multi-scale inverse design and experimental verification of high-entropy solder
Prof LU Jian	Bulk complex concentrated alloys based on grain boundary complexion engineering and study of their toughening mechanisms
Prof ZHU Zonglong	Efficient and Stable Self-assembled Monolayer Hole Transporting Materials for Inverted Perovskite Solar Cells

Faculty Achievement



◆IEEE RTSS '23

The 44th IEEE Real-Time Systems Symposium

Best Paper Award

is granted to

Jinghao Sun, Tianyi Wang, Yang Li, Nan Guan, Zhishan Guo, Qingxu Deng and Guozhen Tan

for the paper

SEAM: An Optimal Message Synchronizer in ROS with Well-Bounded Time Disparity

Jian-Jia Chen, General Chair

Insik Shin, Program Chair

Department of Computer Science

Prof GUAN Nan and six international scholars have received the Best Paper Award at the 44th IEEE Real-Time Systems Symposium. Their paper entitled SEAM: An Optimal Message Synchronizer in ROS with Well-Bounded Time Disparity proposes advancements for the robot operating system (ROS) message synchroniser. They introduce a new synchronisation policy, and demonstrate its effectiveness compared to traditional ROS synchronisers.

Faculty Achievement

Department of Materials Science and Engineering

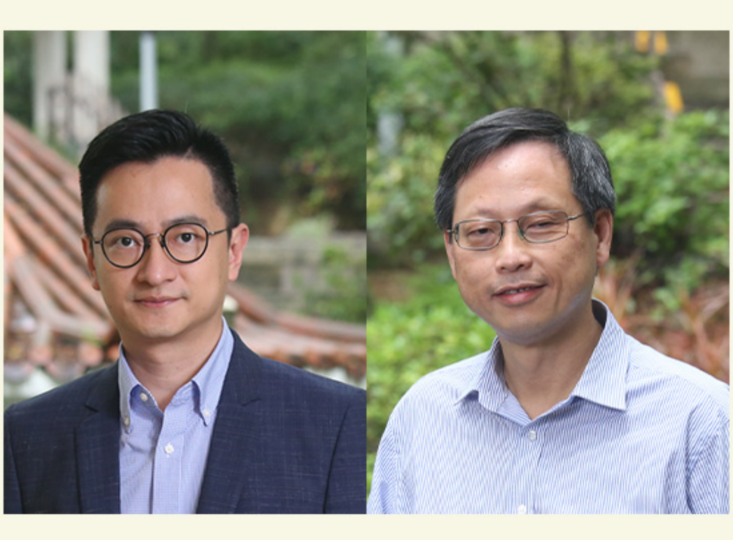
Prof Johnny HO and his research team have published a paper titled Lattice-mismatch-free construction of III-V/chalcogenide core-shell heterostructure nanowires in *Nature Communications*. They developed a versatile strategy utilising the surfactant and amorphous properties of chalcogenide semiconductors to grow lattice-mismatch-free core-shell nanowires. The fabricated nanowires demonstrated controlled shell thicknesses, compositions, and smooth surfaces, and exhibited bi-directional photoresponse and enhanced infrared photodetection. This breakthrough opens up possibilities for high-performance nanowire optoelectronics.

Faculty Achievement

Department of Electrical Engineering

Prof TSAI Din-ping, Prof CHEN Mu-ku, Miss LIU Xiaoyuan, a PhD student under the supervision of Prof Tsai, and Prof Takuo TANAKA at RIKEN have won the Best Paper Award at the International Symposium on Imaging Sensing, and Optical Memory 2023. The winning paper is titled Intelligent Meta-devices for Aerial, Land, and Underwater Imaging.

Faculty Achievement



Department of Electrical Engineering

Congratulations to Prof Steve WONG and Prof K F TSANG for being elected Fellow of IEEE for their contributions to the development of magneto-electric dipole and L-probe feed for wideband and reconfigurable antennas and systems safety engineering, respectively.

Faculty Achievement

Department of Electrical Engineering

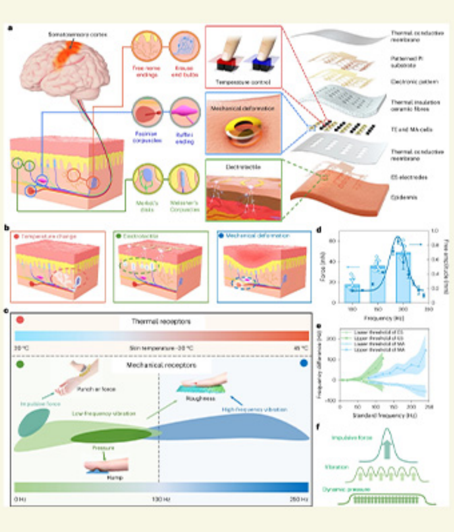
The Centre for Intelligent Multidimensional Data Analysis Limited (CIMDA), led by Prof YAN Hong, has won the Excellent Product Awards at the China Hi-Tech Fair 2023. The winning project titled CIMDA Elderly Care System provides AI functions with 3D animations to elderlies to teach them to do exercises, sing and dance with an avatar, compose music, and chat with the avatar. The annual China Hi-Tech Fair is the largest and most prominent hi-tech exhibition in China covering tech achievement, product display, high-level forums, investment promotions, and business exchange and cooperation.

Faculty Achievement

Department of Mechanical Engineering

A research team led by Prof YANG Yong has published a paper titled Oxidation-induced superelasticity in metallic glass nanotubes in *Nature Materials*. In contrast to the common notion that oxidation weakens metals, researchers have discovered that severely oxidised metallic glass nanotubes exhibit extraordinary recoverable elasticity. These nanotubes can achieve an ultrahigh elastic strain of approximately 14% at room temperature, surpassing other superelastic metals. Through experiments and simulations, they attribute this superelasticity to the formation of an oxide network within the nanotubes, which restricts plastic deformation during loading and restores elastic rigidity upon unloading. This finding suggests unique applications for oxidised low-dimensional metallic glasses in nanodevices.

Faculty Achievement



Department of Biomedical Engineering

Prof YU Xinge and his collaborators have developed a thin and soft multimodal haptic feedback interface that can be directly integrated with skin. Different feedback modes in the interface are used to provide users with diverse sensations, such as force, temperature and texture rendering. The team's work has been published in *Nature Electronics* under the title A skin-integrated multimodal haptic interface for immersive tactile feedback.

Student Achievement

Certificate of Award

Awarded to

City University of Hong Kong
Jinghuai DENG, Jinjie WANG, Shenglin WANG, Haibo HU, Ko Lun KONG

Grand Prix Metaverse Autonomous Driving Challenge 2023

Champion

Prof. Cheng-Zhong XU
Chair of Contest Organization

Departments of Computer Science and Electrical Engineering

FSM Speed, a team led by PhD student Mr DENG Jinghuai and supervised by Prof WANG Jianping, emerged as the champion at the Grand Prix Metaverse Autonomous Driving Challenge 2023. Other team members included Mr HU Haibo, Mr WANG Jinjie, Mr WANG Shenglin and another student from the Department of Electrical Engineering, Mr KONG Ko Lun. Despite the high unpredictability of the simulation environment, the team enhanced various rescue control algorithms and secured a 40% faster completion time than the runners-up.

Student Achievement

Department of Computer Science

A team comprised of BSc Computer Science students Mr FOR Lek Shyuen, Mr WONG Yu Fai, Mr ZHENISHBEK UULU Talantbek, and BEng Computer and Data Engineering student Miss HARIYANTO Vanessa Laurel, under the supervision of Prof Gerhard Petrus HANCKE, triumphed at the 7th HackADay event hosted by PwC Hong Kong. The Hackathon focused on securing AI, and teams were tasked to design interactive applications with AI/ML and cybersecurity considerations.

Student Achievement

Department of Mechanical Engineering

Led by Prof Steven WANG and Dr LIN Wenzhu, a research team comprising PhD students Mr LO Wai Kin, Mr ZHANG Zhenwen, and a PhD student from the School of Energy and Environment, Mr XU Qili, achieved remarkable recognition at the 3rd Chun Wo Innovation Student Awards. Their work on a passive sorbent cooler system, inspired by the properties of camel fur, earned them a Silver Award and the Best Sustainable Solution Award.

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