Attachment: CityU's winning projects

Awards	Research team	Project
Gold Medal with Congratulations of the Jury	**Professor Wang Zuankai**, Chair Professor of Department of Mechanical Engineering (MNE) and Department of Materials Science and Engineering (MSE); **Dr Steven Wang**, Assistant Professor, MNE; and **Ling Chen**, **Yau Xiaoxue**, **Wang Hongbo**, PhD students of MNE	"**Fog-to-electricity Generator with Ultra-high Power Density**" The research team has founded a start-up, which is supported by CityU's flagship entrepreneurship programme HK Tech 300, to transfer the technology into actual application. The research team has introduced the first-ever fog-powered green generator for harvesting energy and freshwater from moisture. It combines a newly developed high-power density droplet-based energy generator (DEG) with a nature-inspired, superhydrophobic fog harvesting mesh. This new technology can produce a record-high power (300 V), with a water collection rate of approximately 250 litre per square meter per day. This dual electricity generator and fog harvester has the highest fog-based energy-conversion efficiency reported to date. It provides a sustainable, stable, low-cost, portable, and eco-friendly power supply solution, while simultaneously tackling the freshwater crisis in many major cities and areas.
Gold Medal	**Dr Tso Chi-yan**, Assistant Professor, School of Energy and Environment (SEE), and **Stanley Liu Sai**, PhD student, SEE	"**Intelligent Thermo-responsive Window for Indoor Thermal Management and Energy Saving in Buildings**" The novel smart window can autonomously regulate solar transmittance in response to the outside temperature. The smart window is transparent in cold weather, allowing solar radiation to pass through to warm a room, and is opaque in hot weather, blocking solar radiation to prevent overheating. This invention can promote the development of energy-efficient and sustainable buildings.
	Dr Wang Lidai, Associate Professor, Department of Biomedical Engineering	"**A Low-cost Multi-contrast Multi-functional Optical-resolution Photoacoustic Microscopy for Early Cancer Diagnostic and Screening**"

	(BME), and **Dr Liu Chao**, PhD graduate, BME	This invention is used for early cancer diagnostic and screening, with three main innovations: advanced multi-spectral light source, real-time imaging speed, and effective tumour-specific multi-functional multi-morphologic image analysis methods. It can also be used in ultrafast neuronal activity recording, multi-functional hemodynamic imaging in brain-related pathologic analysis, and long-term drug release process monitoring during treatment.
	Dr Yu Xinge, Associate Professor, BME	"**Touch VR e-Skin for Metaverse**" This wearable technology enriches the virtual reality/augmented reality (VR/AR) experience through the sense of touch beyond watching and hearing. Designed for everyday use, this wireless and flexible haptic VR e-skin allows wearers to receive haptic feedback in the metaverse and feel the touch of family or friends during video calls. Moreover, for another application, amputees wearing the e-skin can regain their sense of touch.
	Xiaomo Limited led by **Dr Huang Linfeng**, formerly Associate Professor in the Department of Biomedical Sciences (BMS)	"**Biomanufactured and Customized RNAi Library for Any Species**" Xiaomo Limited is a start-up funded by TSSSU, CityU. Bacterial cells are used to produce a highly efficient small interfering RNA (siRNA) library that covers the entire genome of any species. This method enables the discovery of potent RNA-based precision medicines and is both cost-effective and environmentally friendly. It can be applied to a range of diseases and will significantly accelerate the development of RNAi therapeutics.
	Professor Wang Zuankai, Chair Professor of MNE and MSE	"**Structured Thermal Armour**" This thermal armour can be attached to different shaped substrates to remove heat from surfaces at temperatures of 1,200°C or higher. A fast and

		controlled temperature drop of more than 1,000°C can be achieved within several to tens of seconds. The liquid-cooling technologies is to prevent a thermal crisis in ultra-high thermal-fluxed electric devices. It also enables the traditionally impossible efficient-liquid-cooling of extremely high-temperature devices.
	Dr Gajendra Kumar, Research Assistant Professor, Department of Neuroscience (NS); and **Dr Eddie Ma Chi-him**, Associate Professor, NS	"**AI-based Pharmaco-electroencephalography (EEG) Platform for Drug Screening**" The project is developed by AniTech Limited, a HK Tech 300 start-up. This platform aims to facilitate clinical trials for drug candidates based on models for diseases that affect humans and mice with the aim to monitor adverse drug effects and toxicity. It shortens the time required for neurotoxicity and drug efficacy studies and can be used for a personalised prediction of disease outcomes.
Silver Medal	**Professor Fu Hongbo**, School of Creative Media (SCM)	"**DeepFaceDrawing: Deep Generation of Facial Images from Sketches**"
	Professor Michael Leung Kwok-hi, SEE	"**Nano-Photocatalytic Marine Antifouling/Anticorrosion Paint (Nano-MA2P)**"
	Dr Xu Chenjie, Associate Professor, BME	"**Cryomicroneedles for Transdermal and Intradermal Cell Delivery**" The research team has founded a start-up, which is HK Tech 300, to transfer the technology into actual application.
	Professor Hu Jinlian, BME and MSE; and **Su Yupei**, PhD student, BME	"**Super-tough Artificial Spider Silk**" The project is developed by S3Tough Tech Co. Ltd, a HK Tech 300 start-up.
	Professor Hu Jinlian, BME and MSE; **Dr Guo Chunxia** and **Dr Si Yifan**, Postdoc; **Shi Shou**, PhD student, BME	"**JanusLean electrospun nano fibre sheet mask**"

	Dr Yao Xi, Associate Professor, BMS	"**Machine-learning Assisted Discovery of Multifunctional Biopolymer Coating for Pathogen Control**" The project is developed by Medi Biotech Limited, a start-up funded by TSSSU, CityU.
	Dr Vincent Ko Chi-chiu, Associate Professor, Department of Chemistry (CHEM) and member of the State Key Laboratory of Marine Pollution	"**Simple Chemical Modification Methods to Develop Oleophilic and Water-repelling Materials**" Simple photochemical surface modification methods to make functional materials that are both oleophilic and hydrophobic. The new functional materials can absorb oils but repel water and can thus effectively remove oil waste while providing water resistance.
	Dr Alex Wong Chun-yuen, Associate Professor, CHEM	"**RUNPY: a Rapid, Reliable and Convenient Nitrite Detection Kit for Drinking Water Safety**" An one-minute, instrumentation-free nitrite detection kit with high sensitivity and selectivity allows on site drinking water analysis according to WHO and USEPA guidelines.
	Professor Antoni B. Chan, Department of Computer Science (CS)	"**Automatic Wide-area Crowd Surveillance Using Multiple Cameras**"
	Professor Yan Hong, Wong Chun Hong Professor of Data Engineering, and **Fan Xinqi**, PhD student, Department of Electrical Engineering	"**AI-based Face Mask Detection to Assist in the Control of the COVID-19 Pandemic**"
	Professor Zhi Chunyi, MSE, and **Chen Ze**, PhD student, MSE	"**Safe Flexible Batteries and Their Applications**"
	Dr Lo Wing-cheong, Assistant Professor, Department of Mathematics; and supported by **Dr King**	"**Smart Wear Enabling the Visually Impaired and the Elderly the Ultimate Freedom to Explore the World**"

	Lai Wai-chiu, Associate Professor, BME; and **Dr Esther Chow Oi-wah**, Associate Professor, Department of Social and Behavioural Science	The project is developed by AI Guided Limited, a start-up funded by TSSSU, CityU.
	Dr Steven Wang, Assistant Professor, MNE	"**Fast-track Vented Enclosure System for COVID-19 Patient Wards**" The project is developed by SBC Group, a HK Tech 300 start-up.
Bronze Medal	**Dr Zhu Kening**, Associate Professor, SCM and CS	"**Method of Enabling Gesture-based Interaction on the Surface of a Low-cost VR Head-mounted Display**"
	Dr Lam Yun-wah, Associate Professor, CHEM; and Mr Kwok Shu-hin, Research Assistant, CHEM	"**BING: Antibacterial Compound Extracted from Fish Blood**" The project is developed by Peptide Adventure, a HK Tech 300 start-up.