Appendix

The CUHK projects that received awards at the 50th International Exhibition of Inventions Geneva:

	Awards	Principal investigator and team members (Department)	Project title	Project description
1	Gold Medal with Congratulations of the Jury	Professor Liao Wei-hsin, Dr Li Xin (Department of Mechanical and Automation Engineering)	Battery-free Wireless Keyboard	This wireless keyboard converts keystrokes into electrical energy to transmit signals, eliminating the need for batteries. This enhances reliability and lessens environmental impact, providing a sustainable alternative for wireless devices.
2	Gold Medal with Congratulations of the Jury	Professor Leung Kam-tong, Dr Kathy Chan Yuen-yee, Kobby Ng Wing-hei (Department of Paediatrics)	Fc-engineered CD9 Antibodies for Blood Cancers	Fatal thrombosis induced by CD9 antibodies known in art has largely hindered their clinical translation. We developed Fc-engineered antibodies that could abolish platelet toxicities while retaining potent activity against resistant leukemias, clearing the bottleneck for the development of CD9-targeted therapy.
3	Gold Medal with Congratulations of the Jury	Professor Zhang Li, Dr Liu Wai-shing, Dr Jin Dong-dong (Department of Mechanical and Automation Engineering) Professor Simon Yu Chun-ho (Department of Imaging and Interventional Radiology) Professor Chan Kai-fung (Chow Yuk Ho Technology Centre for Innovative Medicine)	Magnet Micro-/Nano-robot for Endovascular Treatment	This magnetic microrobotic platform is designed to address the current clinical problem of aneurysm embolisation treatment, enabling localised, targeted therapy with more stable and complete filling, and minimising the potential risk of lost embolic agents or incomplete filling.
4	Gold Medal with Congratulations of the Jury	Professor Ngai To, Professor Kwok Man-hin, Dr Liu Liang-dong, Dr Zhang Tong (Department of Chemistry)	O-Spheres SunBlocker – Next Generation Sun Protection Materials	Tailor-made, polymer-free, hollow-sphere O-Spheres SunBlocker protects against UV rays via three applications: 1) 100% coral-friendly physical UV filters; 2) outdoor cooling paint additives to lower surface temperatures; and 3) UV-resistant fabrics.
5	Gold Medal with Congratulations of the Jury	Professor Lam Hon-ming, Wong Fuk-ling (School of Life Sciences)	Stress-tolerant Soybeans for Climate-smart Agriculture	By integrating state-of-the-art genomic research and traditional breeding wisdom, we have developed three strains of multi-stress-tolerant soybean for application in northwest China, which have been planted on 102,600 hectares, bringing

				additional income of RMB 126 million to local farmers.
6	Gold Medal with Congratulations of the Jury	Professor Huang Zhifeng, Professor Yang Lin, Fang Yating (Department of Chemistry)	Transparent Electrodes with Semiconductor Nanopillar Arrays (TESNAs)	This project aims to commercialise large-area transparent electrodes with semiconductor nanopillar arrays, on which manufacturers will produce perovskite solar cells (or modules) to achieve high power conversion efficiencies, high yields, a long photovoltaic performance lifetime and low cost.
7	Gold Medal and Thailand Award for the Best International Invention & Innovation	Professor Benny Zee Chung-ying, Dr Cheng Koi-man, Dr Harvey Hung Cheung-fat, Dr Christina Lam, Dr Waylon Chan Wing-lun, Dr Jack Lee Jock-wai, Maria Lai Ming-po (Centre for Clinical Research and Biostatistics)	AI-based Automatic Retinal Image Analysis (ARIA) to Detect Schizophrenia Risk	Schizophrenia affects 1 in 300 people. AI-driven Automatic Retinal Image Analysis (ARIA) detects schizophrenia risk with over 90% accuracy via retinal analysis, promoting self-awareness and enabling early intervention, and aiding risk monitoring and remission extension for schizophrenia patients.
8	Gold Medal	Dr Lai Hei-ming, Dr Wong Tin-yan, Tsoi Pui-lam, Yau Chun-ngo (Department of Chemical Pathology)	A Simple Additive for Augmenting Enzyme Reaction Rates	We discovered that simply adding two chemicals, the zwitterionic bile salt derivative CHAPSO and a substituted cyclodextrin, can augment the activities of many enzymes above their native range in their usual reaction buffers.
9	Gold Medal	Professor Xing Guoliang, Huang Xuan, Bian Chen (Department of Information Engineering)	An Intelligent LiDAR with Adaptive Focus	This is the world's first advanced adaptive LiDAR system, enhancing scanning efficiency by dynamically optimising scan focus through an intelligent, software-defined mirror controller. It achieves a much higher resolution on the region of interest, leading to significantly more efficient and safer autonomous driving.
10	Gold Medal	Professor Steven Gao, Cheng Hao (Department of Electronic Engineering)	An Ultra-wideband Wide-angle Beam-scanning Phased Array Antenna	This is a part of the Advanced Antennas for a Smart World project, funded by RGC under the Area of Excellence Scheme. The aim is to investigate innovative intelligent antenna technologies for future generations of wireless communications systems.

11	Gold Medal	Professor Cheng Shing-shin (Department of Mechanical and Automation Engineering)	Curve Robotics: Flexible Robotic Solutions for Minimally Invasive Neurosurgery	This flexible robotic system for minimally invasive neurosurgery uses patented flexible manipulators and AI-based navigation to enable curved-path access and precise lesion manipulation in confined spaces with multi-modal sensing.
12	Gold Medal	Professor Yan Zhenyu, Professor Xing Guoliang, Hou Haozheng, Bowen Zheng, Wu Peiheng (Department of Information Engineering)	Sonar-based Underwater Human Activity Monitoring System	This first-of-its-kind underwater sonar system enhances safety in swimming pools by monitoring human activity and alerting lifeguards to potential dangers. Proven effective over two years of deployment in Hong Kong, it can provide valuable support to lifeguards with accurate detection.
13	Gold Medal	Professor Wang Ying, Dr Xie Yi, Wang Hui (Department of Chemistry)	Zero-carbon Innovation: Direct CO_2-to-eFuel Conversion	This novel CO_2-to-eFuel system, integrating advanced electrochemical-plasma reactor architecture, operates at ambient conditions using renewable power.
14	Silver Medal	Professor Xu Jiankun, Professor Patrick Yung Shu-hang, Professor Qin Ling, Dr Michael Ong Tim-yun, Dr Zhang Haozhi, Dr Yao Hao, Wen Zhenkang, Shan Zhengming (Department of Orthopaedics and Traumatology)	A Platform to Precisely Visualise the Spatial Omics of Musculoskeletal Tissue	This versatile platform for 3D visualisation provides integrated services including unbiased labelling of whole musculoskeletal tissue, lossless 3D imaging and quantitative analysis guided by artificial intelligent to achieve precise clinical diagnosis and serve scientific exploration.
15	Silver Medal	Professor Siew C. Ng, Professor Francis K.L. Chan, Dr Raphaela Iris Lau (Department of Medicine and Therapeutics)	A Novel Synbiotic Formula (SIM05): Modulating Gut Microbiome for Skin Health	A novel synbiotic formula (SIM05) is an effective microbiome-based solution to improve skin health and quality of life in adults. A pilot study showed that SIM05 could significantly alleviate symptoms of eczema.
16	Silver Medal	Professor Francis K.L. Chan, Professor Siew C. Ng (Department of Medicine and Therapeutics) Professor Zhang Lin (Department of Anaesthesia and Intensive Care)	AI-DoLPHIN: Multi-omics Platform for Next Gen	AI-DoLPHIN, our AI-powered platform, harnesses one of the world's largest mother-baby biobanks (containing 130,000-plus samples) to pioneer next-generation probiotics.
17	Silver Medal	Professor Patrick Tang Ming-kuen, Dr Max Chan Kam-kwan, Dr Philip Tang Chiu-tsun (Department of Anatomical and	EDC-T: an AI-driven Promising Immunotherapy for Solid Cancers	Using AI and single-cell bioinformatics, we discovered a novel T cell type exists specifically in solid tumours. It can eliminate cancers that are resistant to conventional chemotherapy and T-

		Cellular Pathology)		cell-based immunotherapy, representing a promising immunotherapy approach for solid tumours in clinics.
18	Silver Medal	Professor Chan Kai-fung, Dr Zhang Chong (Chow Yuk Ho Technology Centre for Innovative Medicine) Professor Zhang Li, Dr Pan Chengfeng (Department of Mechanical and Automation Engineering) Professor Philip Chiu Wai-yan, Dr Xia Xianfeng (Department of Surgery) Tian Huaiwen (Department of Biomedical Engineering)	EStent – Battery-free Electronic Stent for Electrical Stimulation of Acid Reflux	The EStent is a wirelessly powered, minimally invasive, soft, deformable electronic stent for acid reflux therapy, enabling deployment via endoscopy and direct electrical stimulation to the sphincter, overcoming the power problems of bioelectronic implants and providing a novel, transoral, patient-friendly treatment.
19	Silver Medal	Professor Lu Xinhui, Professor Zhang Hengkai, Dr Li Shiang (Department of Physics)	GINDeX: Grazing-incidence Non-destructive X-ray testing system	GINDeX, the first industrial-scale thin film characterisation system using grazing-incidence X-ray scattering, enables rapid, non-destructive crystal and flaw analysis across a range of modern technologies, from perovskite and organic optoelectronics to silicon/gallium-based semiconductor devices, advancing manufacturing quality control and process optimisation.
20	Silver Medal	Professor Elvis Chui Chun-sing, Professor Patrick Yung Shu-hang, Professor Louis Cheung Wing-hoi, Professor Zhang Ning, Dr Ronald Wong Man-yeung, Dr Michael Ong Tim-yun, Dr Jonathan Patrick Ng, Dr Michael Mak Chu-kay (Department of Orthopaedics and Traumatology)	Intelligent Assistant in Orthopaedic Surgical Planning	This intelligent assistant for orthopaedic surgeons enhances procedures by processing medical data, pre-setting cutting planes, positioning screws and generating surgical guides via voice commands. It offers real-time feedback, improving precision and patient outcomes in orthopaedic surgery.

21	Silver Medal	Professor Qin Ling, Professor Xu Jiankun, Professor Tong Wenxue, Professor Patrick Yung Shu-hang, Dr Michael Ong Tim-yun, Dr Ronald Wong Man-yeung, Dr Zhang Yuantao, Dr Zhang Qida, Dr Zhang Haozhi (Department of Orthopaedics and Traumatology)	Next Generation of Magnesium-based Hybrid Implants for Skeletal Regeneration	The hybrid implant system represents a breakthrough in orthopedic medicine, featuring an innovative, magnesium-based core design that actively promotes bone healing and regeneration. This advanced implant system combines biocompatibility with controlled degradation properties, creating an optimal environment for natural bone repair. The technology offers a promising solution for various orthopedic applications, from trauma recovery to reconstructive surgery.
22	Silver Medal	Professor Michelle Wang Dan, Dr Marianne Lauwers (School of Biomedical Sciences, Institute for Tissue Engineering and Regenerative Medicine)	TenoVation: Next-gen ECM Solutions for Advanced Sports Care	TenoVation, with its flagship product TenoMatrix, offers advanced regenerative tendon care. Tenomatrix is a low-immunogenic, ECM-based biologic derived from bovine tendons. This highly bioactive product can integrate with a broad portfolio of orthopedic biologics/devices that are tailored for specific medical needs.
23	Silver Medal	Professor Ho Yi-Ping, Dr Cheng Guangyao (Department of Biomedical Engineering)	Ultrafast Photothermal ddPCR System Based on Plasmonic Fluorosurfactant	An ultrafast photothermal ddPCR system using plasmonic fluorosurfactant as a dual-functional droplet stabiliser and nanoheater achieves PCR in 15 minutes via light-driven thermocycling, enabling rapid, sensitive nucleic acid detection with standard ddPCR workflow compatibility.
24	Bronze Medal	Professor Yam Yeung (Centre for Perceptual and Interactive Intelligence, Department of Mechanical and Automation Engineering) Professor Charlie C.L. Wang, Dr Dai Chengkai, Chen Xiangjia, Lam Chun-ping, Sun Binzhi (Centre for Perceptual and Interactive Intelligence)	3D Weaving-based Freeform Sensing Interface	This fabric-based sensing interface is produced through novel 3D weaving technique to conform tightly to complex shapes. The sensor's unique woven layout of conductive threads enables tactile, proximity and gesture sensing, enhancing safety and efficiency in human-robot collaborative applications.
25	Bronze Medal	Professor Liao Wei-Hsin, Professor Zhao Huan, Dr Li Xin (Mechanical and Automation Engineering)	Batteryless Smart Insole for Gait Monitoring	The Batteryless Smart Insole, the first of its kind, uses kinetic energy from walking for real-time gait and health monitoring. It uniquely integrates energy harvesting and motion sensing on one piezoelectric element for wireless transmission.

26	Bronze Medal	Professor Su Qi, Professor Francis K.L. Chan, Professor Siew C. Ng (Department of Medicine and Therapeutics)	GUTISM: AI-driven Gut Microbiome Targeted Precision Nutrition for Autism	GUTISM harnesses AI to tailor precision nutrition targeting the gut microbiome in autism. By analysing microbial data and dietary patterns, it designs personalised interventions to modulate gut-brain interactions, aiming to alleviate behavioural symptoms and enhance metabolic health in autistic individuals.
27	Bronze Medal	Professor Tong Wenxue, Professor Qin Ling, Professor Xu Jiankun, Dr Qi Qiuli, Dr Xiong Naping (Department of Orthopaedics and Traumatology)	Harnessing Evolution Power to Develop Tissue Targeting AAVs for Gene Therapy 2.0	We provide tissue-targeting recombinant adeno-associated viruses (AAVs) by direct evolution technology to solve the lack of targeting property of the wild type. We are exploring the potential application of tissue-targeting AAVs in gene therapy 2.0 through clinical trials as our long-term objective.
28	Bronze Medal	Professor Pauline Lui Po-yee, Professor Patrick Yung Shu-hang, Angel Lee Yuk-wa, Katie Mok Tsz-yan (Department of Orthopaedics and Traumatology)	Injectable Hydrogel with Adiponectin Mimics for Degenerative Tendon Injuries	The invention features an injectable hydrogel loaded with AdipoRon, an adiponectin mimic, for minimally invasive treatment of degenerative tendon injuries. The hydrogel solidifies in situ, releasing AdipoRon to redirect tendon stem cells to tenocyte lineage, reducing inflammation and promoting repair.
29	Bronze Medal	Professor Helen Meng (Centre for Perceptual and Interactive Intelligence, Department of Systems Engineering and Engineering Management) Dr Liu Pengfei, Cheng Ka-hei, Charlie Chen, Wong Yu-yi (Centre for Perceptual and Interactive Intelligence)	No-code AI Platform for Building Reliable, Confidence-scored Chatbots	This no-code AI platform empowers users to build intelligent chatbots from diverse data sources, delivering reliable responses through a patented confidence scoring model, while reducing costs, offering customisation and ensuring data privacy.
30	Bronze Medal	Professor Kwan Mei-po (Department of Geography and Resource Management, Institute of Space and Earth Information Science) Dr Wang Jianying, Dr Zhang Yan, Dr Ying Hanchi, Dr Song Penglin, Dr Zhang Cong (Institute of Space and Earth	Vehicle-kilometrage Estimation Using Remote Sensing Data and Deep Learning	This project uses satellite remote sensing technologies to perform periodic wide-area traffic flow monitoring on urban roads, and has developed advanced deep learning models to provide more comprehensive vehicle-kilometrage estimates.

		Information Science)		

Other projects in which CUHK participated that received awards:

	Awards	Principal investigator and team members (Department)	Project title	Project description
1	Gold Medal with Congratulations of the Jury	Professor Siew C. Ng, Professor Francis K.L. Chan, Dr Raphaela Iris Lau (Department of Medicine and Therapeutics) Dr Oscar Wong (Department of Psychiatry)	A Novel Synbiotic Formula (SCM06): Modulating Gut Microbiome for Happy Child	A novel synbiotic formula (SCM06) is an effective microbiome-based solution to enhance mental and digestive wellness of children. A pilot study showed that SCM06 could significantly alleviate symptoms of anxiety, sensory hypersensitivity and functional abdominal pain in children with autism.
2	Gold Medal	Professor Song Xu, Dr Ding Junhao, Dr Winston Ma Wai-shing, Dr Qu Shuo, Dr Ye Haitao, Mo Haoming, Hu Zongxin (Department of Mechanical and Automation Engineering) Professor Yang Yi-jian, Dr Zheng Xiaoping (Department of Sports Science and Physical Education)	Mass Customisation of Breathable Lightweight Hip Protectors for the Elderly via Automatic Inverse Design and 3D Printing	3D-scan based inverse design and automated lattice generation enable 3D printing of hip protectors with optimised lightweight design that can minimizes the weight and cost, while maximise user comfort. This innovation enhances wear comfort with superior impact energy absorption, effectively reducing the risk of hip fractures during falls.
3	Silver Medal	Professor Elvis Chui Chun-sing, Professor Louis Cheung Wing-hoi, Professor Patrick Yung Shu-hang, Professor Ronald Wong Man-yeung, Leung Ka Hei, Ye Xin, Ericsson Fung Chun-hai (Department of Orthopaedics and Traumatology)	Intelligence Osteoporosis Classification and T-Score System for Chest X-ray	Innovation screening solution for osteoporosis detection utilizes chest X-rays for classification, generating simulated T-scores benchmarked against gold-standard in order to enhance early detection and risk management.