Appendix

CUHK awarded projects in the International Exhibition of Inventions Geneva 2024

	Awards	Principal investigator and team members (Department)	Project title	Project description
1	Gold Medal with Congratulations of the Jury and Prize of Korea Invention Promotion Association (KIPA)	Professor Benny Zee Chung-ying, Dr Jack Lee Jock-wai, Sally Chiu Chung-man, Maria Lai Ming-po (The Jockey Club School of Public Health and Primary Care)	AI Retinal Image Analysis for the Risk of Autism (ASD) and GDD in Preschoolers	AI-based Automatic Retinal Image Analysis (ARIA) that provides a non-invasive, convenient, fast, accurate (>90%) method to assess the risk of Autism Spectrum Disorder (ASD) and Global Developmental Delay (GDD) among preschoolers.
2	Gold Medal	Professor Chen Hongkai, Professor Xing Guoliang, Dr He Yuze (Department of Information Engineering)	VI-Map: Infrastructure-Assisted Real-Time HD Mapping for Autonomous Driving	The first system that exploits the unique cumulative observations made by smart roadside infrastructure to enhance real-time HD map construction for autonomous driving.
3	Gold Medal	Professor Chen Fei, Dong Zhipeng, Wang Shixiong (Department of Mechanical and Automation Engineering)	MightySort: Intelligent Robotic Sorting Systems for MRFs	A waste-sorting robot system that replaces manual labour in recycling plants. It uses visual recognition and robots for efficient sorting and integrates seamlessly into existing processes.
4	Gold Medal	Professor Liao Wei-hsin, Dr Chan Hugo Hung-tin, Dr Liao Hongpeng, Dr Gao Fei, Zhao Xuan (Department of Mechanical and Automation Engineering)	Flexible Exoskeleton for Load Transportation	A versatile back exoskeleton with an intelligent actuation system to assist material handling work, enhancing personal welfare and industrial productivity.
5	Gold Medal	Professor Daniel Ong Hock-chun, Liu Chao, Chan Tak-hong (Department of Physics)	Rapid Biosensing at the Level Down to a Few Molecules	A point-of-care optical platform that offers sensitivity and selectivity comparable to PCR but can conduct early screening for multiple diseases simultaneously in just 15 minutes.
6	Gold Medal	Professor Li Quan, Dr Hu Xitao (Department of Physics)	Breaking Barriers in Li-based Energy Storage: {110} Textured Li Metal Foil Anode	Demonstrates that both {110} and {100} texturing can be achieved on Li/Na metal foil using mechanical techniques. The {110} metal anodes exhibit exceptional performance.
7	Gold Medal	Professor Wang Yao (Department of Obstetrics and Gynaecology)	Advancing Miscarriage Prediction and Diagnosis by Blood Level of Soluble PD-L1	A novel, reliable, non-invasive method for diagnosing and predicting miscarriage by quantitating blood levels of soluble Programmed Cell Death Ligand-1 (sPD-L1).
8	Gold Medal	Professor Jerry Xu Jiankun, Professor Qin Ling, Professor Patrick Yung Shu-hang, Dr Dai Bingyang, Zhang Haozhi, Lei Lei, Wen Zhenkang, An Yuanming, Chen Xin, Zhang Yuantao, Guo Jiaxin (Department of Orthopaedics and Traumatology)	Regenerative Enhancers (Mag Med Biotech)	Start-up manufacturing a range of innovative magnesium-containing products that stimulate the regenerative capacity of the host.

9	Gold Medal	Professor Connie Chong Yuen-yu, Professor Chien Wai-tong (The Nethersole School of Nursing)	Pai.ACT: AI-driven Acceptance and Commitment Therapy for Tailored Mental Health	First NLP system simulating ACT specialists in assessing mental health during user-AI chatbot interactions, providing empathetic responses and customising ACT psychotherapy.
10	Gold Medal	Professor Benny Zee Chung-ying, Dr Harvey Hung Cheung-fat, Dr Jack Lee Jock-wai, Maria Lai Ming-po (The Jockey Club School of Public Health and Primary Care)	AI-based Automatic Retinal Image Analysis (ARIA) for Detecting Depression Risk in Adults	AI-based Automatic Retinal Image Analysis (ARIA) that provides an innovative method for detecting depression risk before the illness occurs in adults: a potential mental health risk screening tool for the general population.
11	Gold Medal	Professor Elvis Chui Chun-sing, Professor Patrick Yung Shu-hang, Professor Ronald Wong Man-yeung, Professor Michael Ong Tim-yun, Professor Louis Cheung Wing-hoi (Department of Orthopaedics and Traumatology)	Ultrasound-Based Navigation System for Minimally Invasive Fracture Reduction	A non-radiative, cost-effective system that uses ultrasound images for real-time 3D reconstruction and surgical navigation, allowing for minimally invasive fracture reduction and internal fixation.
12	Gold Medal	Professor Elvis Chui Chun-sing, Professor Louis Cheung Wing-hoi, Professor Patrick Yung Shu-hang, Professor Qin Ling, Dr Kevin Ho Ki-wai (Department of Orthopaedics and Traumatology)	Automated Patient-Specific Prosthesis Design System for Bone Defects	Facilitates auto bone defect site detection and prosthesis generation. Surgeon-oriented instrumentation functions: bone cuts, prosthesis assembling and internal fixation auto designing tools.
13	Gold Medal	Professor Li Zheng, Professor Philip Chiu Wai-yan, Sun Yichong, Li Yehui (Department of Surgery)	Wireless Localization – Open “Eyes” of Magnetic Robot towards Autonomous Surgery	An intelligent, magnetic, location-aware system using reconfigurable sensor arrays, marking a step forward in the application of serials of magnetic medical robots in autonomous surgery.
14	Silver Medal	Professor Xing Guoliang, Dr Xie Zhiyuan, Dr Ouyang Xiaomin (Department of Information Engineering)	Mozart: A Mobile ToF System for Sensing in the Dark through Phase Manipulation	A pioneering ToF system that excels in generating high-quality sensing images across diverse light conditions, notably facilitating complex sensing tasks in challenging dark environments.
15	Silver Medal	Professor Jonathan Choi Chung-hang (Department of Biomedical Engineering) Professor James Lau Yun-wong, Dr Chan Cecilia Ka-wing (Department of Surgery)	Gold Nanoparticle for Treating Chronic Kidney Diseases	A sub-10nm folic acid-gold nanoparticle that can target kidney tubule cells and act as a self-therapeutic agent for the treatment of kidney fibrosis.
16	Silver Medal	Professor Ngai To, Dr Jiang Zhuolun, Chong Hio-lam (Department of Chemistry)	BactOpack – Cycle to Convenience	Novel biodegradable bacterial cellulose coating EcoShield exhibits extraordinary water resistance, adhesion, durability and antibacterial properties, and can replace plastic packaging materials.

17	Silver Medal	Professor Xu Lei, Professor David Weitz, Dr Xu Zhuo, Dr Zhu Changliang (Department of Physics)	Making Insoluble Drugs Soluble	An invention that can significantly increase the water solubility of various drugs.
18	Silver Medal	Professor Siew C. Ng, Professor Francis K.L. Chan, Professor Su Qi (Department of Medicine and Therapeutics)	Stool Test for Early Diagnosis of Autism Spectrum Disorder	A non-invasive stool test for early risk prediction of autism spectrum disorder in children as young as one year old, which is applicable across the world.
19	Silver Medal	Professor Siew C. Ng, Professor Francis K.L. Chan, Professor Zhang Jingwan, Zheng Jiaying (Department of Medicine and Therapeutics)	Stool MicrobiAl BiomarkeR Test to aid diagnosis of Inflammatory Bowel Disease (IBD-SMART)	A fecal microbiome-based, non-invasive test to diagnose inflammatory bowel disease. It is applicable across populations, with high disease specificity and accuracy.
20	Silver Medal	Professor Qin Ling, Professor Jerry Xu Jiankun, Professor Tong Wenxue, Professor Michael Ong Tim-yun, Professor Ronald Wong Man-yeung, Dr Zhang Qida, Yuantao Zhang, Qing Lu (Department of Orthopaedics and Traumatology)	Hybrid Implants for Handling Challenging Bone Disorders	Hybrid implants that are constructed by combining biologically active magnesium with an inert metallic fixation system. Their efficacy is being tested in several multi-centre clinical trials.
21	Silver Medal	Professor Tong Wenxue, Professor Qin Ling, Professor Jerry Xu Jiankun, Professor Ronald Wong Man-yeung, Zu Haiyue, Zhou Liangbin (Department of Orthopaedics and Traumatology)	Magnesium-based Orthopaedic Implants, for a Better Joint	Innovations that provide cost-effective therapeutic strategies promoting bone regeneration by stimulating osteogenesis, angiogenesis and neurogenesis, accelerating disease recovery.
22	Silver Medal	Professor Lo Kwok-wai, Professor Anna Tsang Chi-man, Dr Tom Hau Pok-man, Dr Wu Man (Department of Anatomical and Cellular Pathology)	Synthetic mRNA for Treating EBV-Associated Cancers	A first-in-class synthetic mRNA nanomedicine designed to effectively activate EBV lytic genes that is used for lytic induction therapy against EBV-driven cancers.
23	Silver Medal	Professor Anna Tsang Chi-man, Professor Lo Kwok-wai, Li Yongshu (Department of Anatomical and Cellular Pathology)	Aptamers as Drug-vehicles and Imaging-probes for EBV-associated Malignancies	The aptamers can be conjugated with chemodrugs for specific delivery to EBV-associated tumors in vivo. They can also serve as imaging probes by conjugation with detection fluorescence or agents.
24	Silver Medal	Professor Liona Poon Chiu-yee, Professor Judy Zhang Tao, Professor Ronald Wang Chi-chiu, Dr Gene Man Chi-wai, Loucia Chan Kit-ying (Department of Obstetrics and Gynaecology)	ProEGCG: Prodrug for Safe and Effective Treatment of Endometrial Cancer	A novel prodrug of epigallocatechin-3-gallate (EGCG), a major component of green tea polyphenols, administered orally for safe and effective treatment of endometrial cancer.

25	Silver Medal	Professor Patrick Tang Ming-kuen, Dr Philip Tang Chiu-tsun (Department of Anatomical and Cellular Pathology)	A Highly Efficient Virus-Free Gene Knock-In System for CAR-T Engineering	A novel virus-free CAR-T cell engineering system that achieves high transfection, cell viability and genomic integrity. It can knock any chimeric antigen receptor into a defined genome region precisely, representing a safe, novel method to mass-produce CAR-T cells for clinical immunotherapy.
26	Silver Medal	Professor Pauline Lui Po-yee, Professor Patrick Yung Shu-hang, Ma Zebin (Department of Orthopaedics and Traumatology)	Injectable FABP4i@Hydrogel for Treating Degenerative Tendon/Ligament Injuries	R&D of an injectable FABP4 inhibitor-hydrogel to treat degenerative tendon/ligament injuries. It can improve tendon and ligament repair and reduce pain while walking, as well as promoting tenogenic differentiation of inflammatory tendon-derived stem cells.
27	Silver Medal	Professor Li Zheng, Professor Philip Chiu Wai-yan, Dr Yip Hon-chi, Chan Wai-shing, Sun Yichong (Department of Surgery)	“Invisible Hands” Perform Dexterous Tissue Manipulation in Endoluminal Surgery	A system and method to perform dynamic traction for tissue manipulation through magnetic control technology in endoluminal surgery.
28	Silver Medal	Professor Juliana Chan Chung-ngor, Professor Ronald Ma Ching-wan, Dr Cadmon Lim King-poo, Dr So Wing-yee (Department of Medicine and Therapeutics)	A Personalized Report for Prediction and Prevention of Diabetes	A novel method incorporating a combination of genetic markers and other information to predict an individual’s future risk of diabetes, in order to prevent adverse clinical outcomes.
29	Silver Medal	Professor Ronald Ma Ching-wan, Professor Kevin Yip Yuk-lap, Professor Juliana Chan Chung-ngor, Dr Kelly Li Yichen (Department of Medicine and Therapeutics)	Methylation Models for Kidney Function and Future Risk of Kidney Failure	A novel method to measure kidney function using methylation markers in blood, with superior performance in clinical risk factors that predict future risk of kidney diseases.
30	Bronze Medal	Professor Yan Zhenyu, Professor Xing Guoliang, He Lixing, Hou Haozheng (Department of Information Engineering)	VibVoice: Bone-Conducted Vibration Speech Enhancement on Head-Mounted Wearables	A new speech enhancement system exploiting bone-conducted vibration to remove dynamic noises. The system is compatible with most existing ear-/head-worn wearable and wireless earphone devices.
31	Bronze Medal	Professor Xia Jiang, Qian Song (Department of Chemistry)	Recombinant Human Collagen Biomaterials	Combining recombinant type III collagen protein (Col III) and antibacterial enzymes, these collagen hydrogel biomaterials with antibacterial activity promote skin healing and treat chronic wounds.

Other CUHK-participated awarded projects

	Awards	Principal investigator and team members (Department)	Project title	Project description
1	Gold Medal	Professor Helen Meng Mei-ling, Dr Liu Pengfei (Centre for Perceptual and Interactive Intelligence)	Shattering Language Barriers in Multilingual, Multiparty Communication with the CPII Medical Assistant	AI-powered productivity tool to automatically transcribe the speech in multilingual, multiparty exchanges into text, translate into a target language and summarise key highlights to capture the gist of the speech.
2	Gold Medal	Professor Siew C. Ng, Professor Francis K.L. Chan, Professor Su Qi (Department of Medicine and Therapeutics)	Precision Oral Microbiome Formula SIM01: Alleviating Multiple Symptoms of Long-COVID	This is the world's first probiotic formula designed for alleviating Long COVID symptoms, including fatigue, memory loss, difficulty in concentration, gastrointestinal upset, and general unwellness.
3	Gold Medal	Professor Elvis Chui Chun-sing, Professor Louis Cheung Wing-hoi (Department of Orthopaedics and Traumatology)	Deep learning method and system for bone health status evaluation and osteoporosis diagnosis	System that uses deep learning algorithms to automatically classify and predict osteoporosis status with T-score using X-ray images of the hip, spine, and wrist.
4	Silver Medal	Professor Helen Meng Mei-ling, Wang Yuejiao, Dr Wong Ka-ho (Department of Systems Engineering and Engineering Management) Professor Patrick Wong Chun-man (Department of Linguistics and Modern Languages) Professor Gong Xianmin (Stanley Ho Big Data Decision Analytics Research Centre) Professor Helene Fung Hoi-lam (Department of Psychology)	A Novel, Naturalistic, Language-based fMRI Task with AI Technologies for Detection and Prediction of Neurocognitive Disorders (NCDs)	Naturalistic, language-based fMRI task, where brain activity from language perception during movie watching is analysed using AI to classify and predict NCD with high precision and superior ecological validity.
5	Silver Medal	Professor Chen Fei, Dong Zhipeng, Wang Shixiong (Hong Kong Centre for Logistics Robotics Limited & SOTA Robotics (HK) Limited)	MagicSort™: Intelligent Recycling System for Identification and Sorting of Municipal Recyclables	MagicSort™, an intelligent recycling bin with smart recognition, sorting, and capacity adjustment, replaces manual sorting, enhancing efficiency and user experience. Its compact design enhances recycling rates and waste reduction.

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