<u>Appendix</u>

CUHK awarded projects in the International Exhibition of Inventions Geneva 2023

		Principal investigator and team		
	Awards	members	Project title	Project description
		(Department)		
1	Gold Medal with	Professor Raymond Tong Kai-yu, Xie	A Powerful and Wearable	A wearable artificial muscle that
	Congratulation of the jury,	Disheng, Su Yujie	Artificial Muscle	outperforms the human skeletal muscle in
	Prize of Saudi Arabian	(Department of Biomedical Engineering)	(ExoMuscle)	all joints in the body and can be
	Delegation			customised to different sizes.
2	Gold Medal with	Professor Alisa Shum Sau-wun	ABarginase: First-in-class	The world's first therapy that treats
	Congratulation of the jury,	(School of Biomedical Sciences)	Drug for Treatment of	multiple metabolic diseases related to
	Prize of the International		Multiple Obesity-related	obesity and insulin resistance, including
	Federation of Inventors'	Professor Thomas Leung Yun-chung, Dr	Metabolic Diseases	type 2 diabetes and nonalcoholic fatty
	Association - IFIA Award	Leo Lee Man-yuen		liver disease, via arginine starvation.
		(The Hong Kong Polytechnic University)		
3	Gold Medal with	Dr Lai Hei-ming	Supramolecular	Uses supramolecular chemistry to
	Congratulation of the jury	(Department of Psychiatry)	Immunohistochemistry for	achieve automated, quantitative 3D
			3D Imaging of Whole Organs	structural-molecular imaging in whole
				organs, laying the foundation for low-
				cost, accessible precision diagnostics and
				advanced research tools.
4	Gold Medal with	Professor Patrick C.M. Wong, Professor	Brain Tech for Babies to	Precision Listening [®] brain technology is
	Congratulation of the jury	Feng Gangyi, Dr Nikolay Novitskiy	Predict Language	a short EEG test conducted on babies
		(Department of Linguistics and Modern	Developmental Problems	while they are sleeping to predict
		Languages)		language developmental problems from
		Professor Leung Ting-fan, Professor		infancy.
		Simon HS Lam		
		(Department of Paediatrics)		
5	Gold Medal with	Professor Francis K.L. Chan, Professor	One Stool Test for Multi-	A gut microbiome-based AI model that
	Congratulation of the jury	Siew C. Ng, Dr Qi Su	Disease Early Detection	can screen for the risk of eight human
		(Department of Medicine and		diseases, including colorectal cancer and
		Therapeutics)		Crohn's disease.
6	Gold Medal with	Professor Zhang Li	RefluxChip – a Miniature,	A miniature, battery-free remote sensing

	Congratulation of the jury	 (Department of Mechanical and Automation Engineering) Professor Philip Chiu Wai-yan (Department of Surgery) Professor Chan Kai-fung (Chow Yuk Ho Technology Centre for Innovative Medicine) Zhang Chong (Department of Biomedical Engineering) 	Battery-free Remote Sensing System for Real-Time Monitoring of Gastroesophageal Reflux Disease	system with an extended detection period for real-time monitoring of GERD in a non-invasive, inexpensive fashion.
7	Gold Medal	Dr Lai Hei-ming (Department of Psychiatry)	Scalable Production of α- CsPbI3 Nanocrystals – a Promising Photovoltaic Material	α-CsPbI3 nanocrystal is the most promising raw material for LEDs and solar cells, but synthesis has required temperatures above 110°C and has not been scalable to above 5ml. This enables industrial, 50ml-scale synthesis at 20°C with similar quality.
8	Gold Medal	Professor Zhang Li, Dr Sun Mengmeng, Liu Wai-shing (Department of Mechanical and Automation Engineering) Professor Philip Chiu Wai-yan (Department of Surgery) Professor Chan Kai-fung (Chow Yuk Ho Technology Centre for Innovative Medicine)	Self-healing Magnetic Slime Robot for Non-invasive Endoluminal Intervention in the Gastrointestinal System	A soft robot that can navigate in tiny or tortuous lumens, perform various functions, and has great potential in minimally invasive endoluminal intervention.
9	Silver Medal	Professor Chen Shih-chi, Charudatta Datar, Dr Zhong Qiuyuan, Dr Han Fei, Gu Songyun (Department of Mechanical and Automation Engineering)	Femtosecond Projection NanoPrinter	The world's first sub-50 nanometer precision, ultra-fast, low-cost, multi- material 3D printer.
10	Silver Medal	Professor Li Zheng, Dr Peter Chiu Ka- fung, Professor Philip Chiu Wai-yan, Professor Ng Chi-fai, Luo Xiao (Department of Surgery) Dr Lei Man-cheong (Multi-scale Medical Robotics Center)	A Semi-autonomous Transperineal Prostate Biopsy Robotic System with Minimal Invasion	Proposes a novel, semi-autonomous transperineal prostate biopsy and ablation robotic system with minimal invasion.

		Professor Liu Yunhui (Department of Mechanical and Automation Engineering)		
11	Silver Medal	Professor Raymond Tong Kai-yu, Cathy Lau Choi-yin, Shi Yehua, Wang Xiaoyi, Liu Zhaoyu, Chen Jingxun, Lu Hsuan-yu (Department of Biomedical Engineering)	AR and VR TeleRehab and TeleFitness System	An intelligent human-computer interaction rehabilitation and fitness training platform that provides online, therapist-designed training exercises with real-time AR/VR visual and audio guidance.
12	Silver Medal	Professor Ren Hongliang, Hao Ruoyi, Gao Huxin (Department of Electronic Engineering)	A Vision-guided Fibreoptic Nasotracheal Intubation Robot	Achieves unmanned nasotracheal intubation more efficiently and safely.
13	Silver Medal	Professor Ngai To, Liu Liangdong, Dr Zhang Tong (Department of Chemistry)	Novel Sustainable Inorganic Hollow UV Filters for Cosmetic Applications	Hollow, mineral-based microspheres that act as physical UV filters in sunscreen. Without any microplastics, the pure inorganic physical filters can not only boost UV-ray scattering efficiency, but also tackle the problems of overly thick texture and unwanted white marks. They are safe for both humans and wildlife.
14	Silver Medal	Professor Phillip Yam Sheung-chi, Cheng Pok-him, Ross Sun (Department of Statistics)	Comonotone-independent Bayes Classifier (CIBer)	A novel fintech tool that allows for effective modelling of the dependence structure among various feature variables through organised treatments, resulting in superior performance.
15	Silver Medal	Professor Li Zheng, Li Yehui, Professor Philip Chiu Wai-yan, Professor James Lau Yun-wong (Department of Surgery) Sun Yichong (Multi-scale Medical Robotics Center)	An Automatic Stomach Screening Method Using a Magnetically Actuated Capsule Endoscope	Proposes a novel automatic stomach screening method using magnetically actuated capsule endoscopes.
16	Silver Medal	Professor Darwin Lau Tat-ming, Chan Sheung-yan, Elizabeth Chao Ting (Department of Mechanical and Automation Engineering)	Modular, Foot-controlled, Cable-actuated Prosthetic	Uses the motion of the foot to actuate a modulus prosthetic, allowing the user to control the tool intuitively.
17	Silver Medal	Professor Qin Ling, Professor Patrick	Magnesium-incorporating	The bioactive artificial ligament

		Yung Shu-hang, Professor Xu Jiankun, Dr Michael Ong Tim-yun, Zhang Haozhi (Department of Orthopaedics and Traumatology)	Bio-artificial Ligament	containing magnesium and spidroin is fabricated by electrospinning.
18	Silver Medal	Professor Chen Chun (Department of Mechanical and Automation Engineering) Dr Yu Xinxian (The Jockey Club School of Public Health and Primary Care) Ronaldo Chan Hoi-fung, Xiao Can (Department of Mechanical and Automation Engineering)	Scalable Recycled Material- based Radiative Cooling for Free Cooling Harvesting	A high-performance radiative cooling paint based on recycled glass. It can be applied to buildings to produce passive cooling without energy consumption.
19	Silver Medal	Professor Francis K.L. Chan, Professor Siew C. Ng, Dr Qi Su (Department of Medicine and Therapeutics)	Go with your Gut to Predict Post Acute COVID Syndrome	A gut microbiome-based AI model that can predict the risk of developing post- acute COVID syndrome (PACS).
20	Bronze Medal	Professor Yang Xiao, Dr Adrian Chu Jun, Tsang Man-wai (Department of Microbiology) Dr Ma Cong (The Hong Kong Polytechnic University)	Novel Antibiotic Candidates	A series of first-in-class antibiotic candidates. Proprietary AI programs helped to discover new chemical entities with antimicrobial activities with a novel drug target and mechanisms-of-action, demonstrating low toxicity and low drug resistance, and effectively treating infections caused by antimicrobial- resistant bacterial pathogens.
21	Bronze Medal	Professor Ngai To, Dr Zhu Yuwei (Department of Chemistry) Professor Xu Jiankun (Department of Orthopaedics and Traumatology)	Novel Injectable Magnesium- based Scaffold for Treating Osteoporotic Bone Defects	A novel, hierarchical, porous magnesium oxychloride cement foam (MOCF)- derived scaffold with appropriate bio- resorption kinetic and superior bioactivity for bone defect repair, showing promising potential as next-generation osteoporotic bone repair materials.
22	Bronze Medal	Professor Elvis Chui Chun-sing, Lawrence Lau Chun-man, Professor Patrick Yung Shu-hang, Dr Law Sheung-	Machine Learning Algorithm for Knee Arthroplasty Loosening Detection	An image-based machine-learning algorithm that can detect total knee arthroplasty loosening and benchmark

		wai, Dr Gene Man Chi-wai, Ye Xin, Ericsson Fung Chun-hai, Randy Ng Hin- ting, Michelle Chan Mei-shuen (Department of Orthopaedics and Traumatology)		against senior orthopaedic surgeons.
23	Bronze Medal	Professor Elvis Chui Chun-sing, Professor Patrick Yung Shu-hang, Ringo Cheung Wing-hing, Kyle Mak Ka-kwan, Ericsson Fung Chun-hai, Randy Ng Hin- ting (Department of Orthopaedics and Traumatology) Dr Kelvin Chong Kam-lung (Department of Ophthalmology and Visual Sciences)	Semi-Automated Imaging Reconstruction for Orbital Fracture Repair	This software system can automatically detect orbital fractures and locate the fracture site accurately displayed in a 3D reconstructed model.
24	Bronze Medal	Professor Chen Xi, Professor Chen Benmei, Yang Guidong, Zhang Jihan, Zhao Benyun, Gao Chuanxiang, Cheung Ka-lung (Department of Mechanical and Automation Engineering)	Drone and AI-based Digital Platform for Outdoor Built Asset Inspection and Information Management	An autonomous outdoor built asset inspection and management platform based on an integrated multi-drone system, AI and efficient 3D reconstruction for BIM and GIS.
25	Bronze Medal	Professor Chen Xi, Professor Chen Benmei, Wang Ruoyu, Chen Yizhou, Guo Zixuan, Mark Kyeredey Ansah, Zhai Yu (Department of Mechanical and Automation Engineering)	Autonomous Indoor Drone Inspection and Modelling System	A fully autonomous indoor drone inspection system with a novel GPU- accelerated mapping algorithm and an AI-based building information modelling method.
26	Bronze Medal	Professor Xu Jiankun, Professor Qin Ling, Dr Li Ye, Professor Tong Wenxue, Dr Michael Ong Tim-yun, Dr Yao Hao, Dr Dai Bingyang, Dr Ronald Wong Man- yeung (Department of Orthopaedics and Traumatology) Professor Ngai To, Dr Zhu Yuwei (Department of Chemistry)	Bio-products for Recapitulating Nerve-vessel- bone Network	A series of bio-products that can promisingly reconstruct the nerve-vessel- bone network, which is crucial for realising functional skeletal tissue regeneration.