Outputs Arising from Dean's Research Fund

Eleventh Round

Individual Research Scheme (IRS)	
Project Leader	**Dr Bai Shurui Tiffany, MIT**
Project Title *(Ref No.)*	Leveraging Generative AI for Scenario Writing in Scenario-Based Learning *(IRS-1)*
Output:	Journal / Book 1. **Bai, S.***, & Tian, P. **(2025)**. Educational robotics may enhance students' conceptual knowledge, applied skills, and learning attitude in STEM education. *Educational Technology & Society*, *28*(4), 274-303. 2. *Interactive Learning Environments (Under Review)* Conference 1. Date: April 2025 (Denver, USA) Name: American Educational Research Association – 2025 Annual Meeting Title: Comparing the Effectiveness of AI-Powered Scaffolding and Human Teacher Scaffolding on Instructional Design External Grant 1. Germany/Hong Kong Joint Research Scheme 2025/26 Project Title: Investigating Cognitive Strategies and Motivational Changes in Student Co-Design of Multimodal Digital Storytelling Artifacts Using Generative Artificial Intelligence: A Design Problem Solving Perspective (Date of Application: June 2025; Total Budget Requested: $87,200) Other Impact / Output 1. President's Awards for Outstanding Performance in Teaching 2024/25
Project Leader	**Dr Chan Man Ho, SES**
Project Title *(Ref No.)*	Constraining Dark Matter Properties by the Data of Black Hole Binaries *(IRS-2)*
Output:	Journal / Book 1. **Chan, M. H.* (2025)**. Atmospheric absorption of dark matter. *The Astrophysical Journal*, *984*(1), 43. 2. **Chan, M. H.***, & Lee, C. M. **(2025)**. Identifying dark matter signals by the radio continuum spectral data of the cool-core cluster RX J1720.

	1+ 2638. *Monthly Notices of the Royal Astronomical Society*, *536*(2), 1127-1134. 3. **Chan, M. H.* (2026)**. The Exotic Black Hole–Neutron Star Binaries in Our Galaxy. *The Astrophysical Journal*, *996*(1), 2. External Grant 1. GRF Project Title: Revealing the Signals of Dark Matter by High-Quality Galactic Radio Data (Date of Application: October 2025; Total Budget Requested: $553,200)
Project Leader	**Dr Cheng Jinping, SES**
Project Title *(Ref No.)*	Exploring the Dynamic Interplay between Microplastics and Harmful Algal Species and the Impacts in Coastal Waters *(IRS-3)*
Output:	Journal / Book 1. Lo, L. S. H., Tong, R. M. K., Chan, W., Ho, W., & **Cheng, J.* (2025)**. Bacterial pathogen assemblages on microplastic biofilms in coastal waters. *Marine Pollution Bulletin*, *216*, 117958. Conference 1. Date: November 2024 (Guangzhou) Name: "Southeast Asian Forum" 2024 International Conference Title: eDNA bioinformatics for the monitoring of harmful biological agents in coastal waters 2. Date: December 2024 (Hong Kong) Name: The 1st International Conference on Health, Environment, Education and Research (CHEER2024) / The 10th International Conference on Water Resources and Environment (WRE2024) Title: Selective Succession and Enrichment of Pollutants in (Micro)plastic Biofilms and Environmental Risks 3. Date: February 2025 (Wellington, New Zealand) Name: 2nd Australian & New Zealand Environmental DNA (eDNA) Conference. The Southern eDNA Society Title: Harmful Pathogens, and Algae Functional Database to Empower Environmental DNA Monitoring in Coastal Waters

	4. Date: August 2025 (Hong Kong) Name: The 3rd International Conference on Biodiversity, Ecology, and Conservation of Marine Ecosystems Title: High-throughput monitoring of phytoplankton community dynamics and screening of harmful and bloom-forming algae in coastal waters with updated functional screening database. Other Impact / Output 1. **Cheng J.** Best Environmental Innovation Award at "Southeast Asian Forum" 2024 International Conference Title: eDNA Bioinformatics for the Monitoring of Harmful Biological Agents in Coastal Waters
Project Leader	**Dr Chu Man Ying Amanda, SSPS**
Project Title *(Ref No.)*	Using Network Methods to Understand Causal Relationships among Family Resilience, Caregiver Behavioural Problems, Depressive Symptoms, and Burdens *(IRS-4)*
Output:	Journal / Book 1. **Chu, A. M***., Woo, D. H., Tiwari, A., Yuk, H., & So, M. K. **(2025)**. Which types of family caregivers are more prone to developing depression? Leveraging non-financial social support to mitigate depression. *Current Psychology*, *44*(1), 73-84. Conference 1. Date: August 2025 (Tokyo, Japan) Name: 8th International Conference on Econometrics and Statistics (EcoSta 2025) Title: An Emotional Analysis of Speech for Depression Detection External Grant 1. HMRF Project Title: Employing the Real-time Automatic Speech Analytics Program (ASAP) for Family Members Interviews: Instant Assessing Family Conflict through Textual and Acoustic Features (Date of Application: March 2025; Total Budget Requested: $1,058,000) Other Impact / Output 1. Collaborated with researchers from other disciplines and departments across various universities in Hong Kong, promoting interdisciplinary and cross-departmental research.

Project Leader	**Dr Fu Hong, MIT**
Project Title *(Ref No.)*	Computer Vision Embedded Tactile Sensing for Nature Machine Intelligence *(IRS-5)*
Output:	Journal / Book 1. Xie, W., Wei, Y., & **Fu, H.* (2025)**. Neural grey system model based on generalized conformable fractional derivatives and its applications. *Applied Mathematical Modelling*, 116420. External Grant 1. ITF Project Title: A Sensory Glove for Humanoid Robotic Hand with Intelligent Perception (Date of Application: February 2025; Total Budget Requested: $1,400,000) Other Impact / Output: 1. Seminar held in 6th August 2024, titled "Posture Capturing via Wearable Elastic Clothing and AI Algorithms 2. Poster for International Postgraduate Roundtable and Research Forum Summer School 2024.
Project Leader	**Dr Li Wai Chin, SES**
Project Title *(Ref No.)*	Effects of Mn Oxidizing Bacteria on Mn Transformation, and Cycling of Nutrients and Heavy Metal(loid)s in Mn Mine Tailing *(IRS-6)*
Output:	Journal / Book 1. Huang, Y., Luo, Y., Wu, C.*, Xue, S., Chen, H., Wu, Y., & **Li, W.* (2025)**. Synergistic multi-metal stabilization of lead–zinc smelting contaminated soil by Ochrobactrum EEELCW01-loaded iron-modified biochar: performance and long-term efficacy. *Biochar*, *7*(1), 58. 2. Huang, Y.*, Luo, Y., Wu, C.*, **Li, W.**, Chen, H., Wu, Y., & Xue, S.* **(2025)**. The biomineralization process of Ochrobactrum EEELCW01 and its implication for arsenic immobilization. *Soil & Environmental Health*, *3*(2), 100141. 3. Pan, J., Wu, C.*, Lv, Y., **Li, W.**, Wang, J., Hu, M., ... & Xue, S.* **(2025)**. Manganese residue harmlessness with the combination of manganese mineralizing microbes, CaO and CO2. *Journal of Environmental*

	Sciences. 4. Wu, C., Wu, Y., Pan, J., Lv, Y., **Li, W.***, Hu, M., ... & Xue, S.* **(2026)**. Evolution and role of manganese-transforming bacterial microorganisms during natural manganese-tailing succession. *Journal of Environmental Sciences*. External Grant 1. GRF Project Title: Aging Behaviour of Microplastics at the Redox Interfaces of Paddy Soils and Implications for Accumulation in Rice (Date of Application: 2025; Total Budget Requested: $612,480)
Project Leader	**Dr Man Yu Bon, SES**
Project Title *(Ref No.)*	The Impact Mechanism of Per- and Polyfluoroalkyl Substances on Microbial Nitrogen Removal in Sewage Sludge Biochar Integrated Constructed Wetlands *(IRS-7)*
Output:	Journal / Book 1. Zhang, F., Shen, C.*, Zhao, Y., Kong, L., Ju, F., Ji, B., ... **Man, Y. B.**… & Zhang, J.* **(2025)**. Biofilm-enhanced PFAS removal in constructed wetlands: Sewage sludge biochar drives adsorption and microbial synergy. *Chemical Engineering Journal*, 167257. External Grant 1. GRF Project Title: Carbon-enriched Diet for Reduced Uptake of Antibiotics, Metals, And Microplastics in Fish, Resulting in Decreased Spread of Antibiotics and Metal Resistance Genes in Both Fish and The Environment. (Date of Application: November 2025; Total Budget Requested: $990,700)

Interdisciplinary Research Scheme (IDS)	
Project Leader	**Dr Deng Wenjing, SES**
Project Title *(Ref No.)*	Assessment of Perfluorinated Compounds Exposure in Chinese Children *(IDS-1)*
Output:	Journal / Book 1. **Deng, W. J.***, & Lee, J. C. K.* (2025). Urinary Caffeine Levels in Chinese Children: Insights from Diet, Gender, and Regional Variations. *Nutrients*, *17*(9), 1594. Conference 1. Date: November 2025 (Jiangmen) Name: 全國環境化學大會 Title: EDCs in Chinese Children and Contributing Factors External Grant 1. HMRF Project Title: Machine Learning for Predicting Children's Exposure to Endocrine Disrupting Chemicals (EDCs) and Children Health (Date of Application: March 2025; Total Budget Requested: $1,484,360)
Project Leader	**Dr Sun Fenghua, HPE**
Project Title *(Ref No.)*	The Interrelationships of Parent-Child Co-participation in Physical Activity, Parent-Child Relationship, Parenting Behaviours, and Parental Stress Among Normal Children and Their Parents of Hong Kong: A Cross-Sectional Study *(IRS-3)*
Output:	Journal / Book 1. Fang, Y., Wang, Z., Chen, S., Wu, H., Cheung, D. H., Zhang, B., ... & **Sun, F.* (2025)**. The Role of Parental Physical Literacy in Family Dynamics: A Systematic Scoping Review of Existing Evidence. *Child: Care, Health and Development*, 51(4), e70119. 2. "Sweat it Together!" The Positive Relationship between Parent-Child Co-participation in Physical Activities and Family Harmony: Evidence from 1,504 Chinese Parents. *(Under Review)* External Grant 1. HMRF Project Title: Does it work? Efficacy of A Chatbot-delivered Parent-led Physical Activity Promotion Intervention among Physically Inactive Children (Date of Application: March 2025; Total Budget Requested:

	$1,487,162) Other Impact / Output 1. Collaborated with scholars from the Chinese University of Hong Kong and Shenzhen Longhua District Jihua Public Health Service Centre.

International Collaborative Research Scheme (ICRS)	
Project Leader	**Dr Ching Ping Pui, SES**
Project Title *(Ref No.)*	Examining the Aerosols impact on Climate and Air Quality: Insight from Modelling and Microscopy *(ICRS-1)*
Output:	External Grant 1. ECS Project Title: Unravelling Aerosol Impacts on Climate Change Through Integrated Regional-scale and Particle-resolved Modelling (Date of Application: October 2025; Total Budget Requested: $601,000) Other Impact / Output 1. Collaborated with Zhejiang University, Meteorological Research Institute of Japan Meteorological Agency, Waseda University, and Tokushima University.
Project Leader	**Prof Chow Cheuk Fai Stephen, SES**
Project Title *(Ref No.)*	High-valent Iron Catalysts for Activation and Azidation of Unreactive C(sp3)–H Bonds *(ICRS-2)*
Output:	Journal / Book 1. Acid-boosted Catalytic Azidation of Unreactive C-H Bonds with and Iron Complex. *(Under Preparation*) External Grant: 1. GRF Project Title: Decarbonizing Polymer Waste via Reductive Solid-State C-H Conversion to Hydrogen and Functional Carbides (Date of Application: November 2025; Total Budget Requested: $827,960)
Project Leader	**Dr Leung Chi Fai, SES**
Project Title *(Ref No.)*	Development of Precious-Metal-Free Supramolecular Catalysts and Z-scheme Catalytic Composites for Photoreduction of Carbon Dioxide *(ICRS-4)*
Output:	Journal / Book 1. Highly Efficient CO2-to-CO Reduction using a Novel Precious-metal Free Photocatalytic System *(Under Preparation)* Conference 1. Date: December 2025 (Honolulu, USA) Name: Pacifichem 2025 (Honolulu)

	Title: Catalytic CO2 Reduction using 3D Metal Quaterpyridine Catalysts and an Organic Photosensitizer External Grant 1. GRF Project Title: Dual Catalysis Strategy for C-H Photooxygenation via in-situ Hydrogen Peroxide Generation (Date of Application: October 2025; Total Budget Requested: $1,500,000)
Project Leader	**Dr Shang Liang Echo, SSPS**
Project Title (Ref No.)	Cues of Compassion: Enhancing Compassionate Organizing in the Digital Age *(ICRS-5)*
Output:	Journal / Book 1. **Shang, L. E.***, & Jin, S. Q. **(2025)**. A Compassion Paradox: Can AI Truly Bridge the Empathy Gap in Human Relationships?. In *Artificial Intelligence and the Future of Human Relations: Eastern and Western Perspectives* (pp. 149-171). Singapore: Springer Nature Singapore. 2. Cues of Compassion: Empathetic Reasoning and AI-Enhanced Narratives in Charitable Crowdfunding. *(Under Preparation)* Conference 1. Date: July 2025 (Athens, Greece) Name: European Group for Organizational Studies (EGOS) Colloquium 2025 Title: Artificial Intelligence and Sector Bias in Public Policy: Reassessing Citizens Trust and Institutional Legitimacy 2. Date: August 2025 (Copenhagen, Denmark) Name: Academy of Management (AOM) Annual Meeting 2025 Title: Artificial Intelligence and Sector Bias in Public Policy: Understanding Citizens Trust and Support 3. Date: August 2025 (Copenhagen, Denmark) Name: Academy of Management (AOM) Annual Meeting 2025 [Professional Workship] Title: Human-and Artificial Intelligence-Generated Storytelling for Pitching Effectiveness

	External Grant 1. ECS Project Title: Speaking the Language of Legitimacy: AI-Powered Narrative Sense-Giving in Social Enterprises (Date of Application: 2024; Total Budget Requested: $598,947) Other Impact / Output 1. Collaborated with Utrecht University
Project Leader	**Dr Sun Daner, MIT**
Project Title (Ref No.)	Developing an AI-Driven Tutoring System to Scaffold the Mathematical Word Problem Solving Skills of Low-Motivation Students *(ICRS-6)*
Output:	Journal / Book 1. Liu, J.*, **Sun, D.***, Sun, J.*, Wang, J.*, & Yu, P. L. H.* **(2025)**. Designing a generative AI enabled learning environment for mathematics word problem solving in primary schools: Learning performance, attitudes and interaction. *Computers and Education: Artificial Intelligence*, *9*, 100438. 2. Liu, J., Keane, T., **Sun, D.***, Yang, Y., & Yang, Y. **(2025)**. Design and evaluation of ChatGPT-MWPS: an AI-enhanced learning system for improving primary students' mathematical word problem solving. *Smart Learning Environments*, *12*(1), 68. 3. Unravelling the Mechanism of AI-Enhanced Mathematics Problem-Solving: The Synergistic Effects of Adaptive Scaffolding and Multi-Agent Collaboration *(Submitted)* 4. How Adaptive Scaffolding Works: The Interaction Between Support Strategies and Student Learning Performance in Elementary Math Learning *(Under Preparation)* Conference 1. Date: November 2024 (Quezon City, Philippines) Name: The 32nd International Conference on Computers in Education (ICCE 2024) Title: AI-driven feedback for enhancing students' mathematical problem-solving: The ScaffoldiaMyMaths system 2. Date: May 2025 (Wuxi) Name: The 29th Global Chinese Conference on Computers in

	Education Title: 基於生成式人工智慧的小學數學應用題學習環境設計及其研究 3. Date: October 2025 (Hong Kong) Name: The 12th International Conference on Behavioural and Social Computing Title: Designing an Interactive AI-Supported Learning System for Mathematics Education in Primary Schools Other Impact / Output 1. Patent: **Sun, D***., Chou, K.L., Yang, L., Wang, J. (2024, Nov). A System and Method for Teaching Mathematics through Adaptive Scaffolding Support. Patent No. P00243.HKS 2. Collaborated with Hubei Key Laboratory of Digital Education at Central China Normal University, La Trobe University, and the Hong Kong Polytechnic University
Project Leader	**Dr Tan Weiqiang, SSPS**
Project Title *(Ref No.)*	Does Algorithmic Trading Affect Stock Price Crash Risk? *(ICRS-7)*
Output:	External Grant 1. Germany / Hong Kong Joint Research Scheme Project Title: Cross-border Transmission of Climate Risks: The perspective of Trade Network (Date of Application: June 2025; Total Budget Requested: $34,000)
Project Leader	**Dr Tsang Yiu Fai Chris, SES**
Project Title (Ref No.)	Stabilization Mechanisms of Endogenous Heavy Metals in Biochar Derived from Livestock Manure *(ICRS-8)*
Output:	Journal / Book 1. Kwon, D., Kim, J. Y., Song, H., Lee, J., **Tsang, Y. F.***, & Kwon, E. E.* **(2025)**. CO2-mediated pyrolysis for syngas generation from wood-plastic composite waste. *Energy*, *319*, 134917. 2. Lee, G. B., Ahn, C. E., Jeong, W. G., **Tsang, Y. F.***, & Baek, K.* **(2025)**. Environmental impact assessment of pyrolysis and incineration including end-of-life of sewage sludge by-products. *Bioresource Technology*, *435*, 132929.

	External Grant 1. GRF Project Title: Inhibitory Effects of Waste-derived Pyrolytic Oil from Mixed Plastics on Biosynthesis of Polydroxyalkanoate (PHA)-based Copolymers: Mechanisms and Mitigation Methods (Date of Application: October 2025; Total Budget Requested: $1,174,500) Other Impact / Output 1. 2026 Silver Medal, the 51st International Exhibition of Invention of Geneva 2026, Switzerland
Project Leader	**Dr Zhang Qiaoping, MIT**
Project Title (Ref No.)	The Impact of Student's Mathematical Well-being on STEM Career Interest: A Comparative Study between Mainland China, Hong Kong, and Japan *(ICRS-9)*
Output:	Journal / Book 1. **Zhang, Q.***, Choy, B. H., & Lee, M. Y. **(2025)**. Teacher noticing in diverse educational contexts: Concepts, research, and future pathways. *ECNU Review of Education*, *8*(3), 924-934. 2. **Zhang, Q.***, Fang, H.*, & Tang, X*. **(2025)**. Modeling mathematical well-being among undergraduates: An exploratory study in Mainland China. *International Journal of Educational Research Open*, *9*, 100507. 3. The Classification of Factors Influencing Interests in Stem Careers: A Disciplinary Scoping Review. *(Under preparation)* Conference 1. Date: May 2025 (Hong Kong) Name: International Conference on Learning and Teaching 2025 Title: Undergraduate Students' Mathematical Well-being in China: A Pilot Study External Grant 1. GRF Project Title: Examining the Impact of Preservice Teachers' Noticing on Teaching Practice: A Mixed Method Study (Date of Application: November 2024; Total Budget Requested: $1,262,932)