

PROF. BRUNO SICILIANO



SEMINAR ANNOUNCEMENT

WHO: Dr. Fel CHEN Collaborative and Versatile Robots Laboratory Department of Mechanical and Automation Engineering The Chinese University of Hong Kong https://www4.mae.cuhk.edu.hk/peoples/chen-fei/

WHAT: Human Skill Transfer for Autonomous and Collaborative Robotics

WHEN: Tuesday, 17 June 2025, 15:00-16:00

WHERE: Via Claudio, Bldg 3, Ground Floor, Room C2-A <u>Microsoft Teams</u>

Abstract — Humans possess remarkable abilities to collaborate physically by adapting their actions to the change of environments, movements of their partners and the demands of the tasks. Harnessing these human capabilities for autonomous and collaborative manipulation tasks in humanoid robots offers transformative potential for advancing embodied intelligence in humanoid robotics. This research introduces an innovative skill learning framework designed to enable humanoid robots, particularly dual-arm systems, to learn and perform complex autonomous and collaborative manipulation tasks from human demonstrations. The framework integrates multi-modal human data, including motion trajectories and electromyography signals, to extract key parameters such as limb impedance and adaptive strategies, ensuring precise execution of autonomous and collaborative tasks. It can also model human interaction strategies, enabling robots to dynamically adapt to human partners during cooperative operations such as object transportation and handling. Validation through diverse tasks, including stir-frying and Tai Chi, underscores the framework's societal impact and its contribution to enhancing embodied artificial intelligence.

Biosketch — Prof. **Fei Chen** received the B.S. degree in computer science from Xi'an Jiaotong University in 2006, the M.S. degree in computer science from Harbin Institute of Technology in 2008, and the Dr. Eng. degree in robotics from Nagoya University, Japan, in 2012. Then he joined the Department of Advanced Robotics at the Italian Institute of Technology and found the Active Perception and Robot Interactive Learning laboratory. Since 2020, he has been an assistant professor with Department of Mechanical and Automation Engineering at The Chinese University of Hong Kong. He is also affiliated as Co-PI with CUHK T Stone Robotics Institute and Hong Kong Centre for Logistics Robotics. He has participated in the European Robotics Challenge and led several EU and Italian national projects, including EU FP7 EUROC-



AutoMAP, Italian National Project MIUR VINUM, EU H2020 Chist-Era Learn-Real, and the Italy-Japan International Cooperation Project Learn-Assist. Since joining CUHK, he has been focusing on the research on humanoid robot manipulation and human-robot collaboration. He has published over 100 papers in journals and conferences. He serves as a key member of the IEEE RAS Technical Committee on Neuro-Robotics and holds leadership positions in various prestigious robotics conferences, including Program Chair roles at IEEE ARSO 2024, IEEE RO-MAN 2024, IEEE ROBIO 2024 and Student Affair Chair for ICRA2024, Local Chairs for IROS2025. He also serves as Associate Editor for multiple IEEE journals, including IEEE Transactions on Cognitive and Developmental Systems (TCDS) and IEEE Transactions on Emerging Topics in Computational Intelligence (TETCI), while reviewing for numerous academic journals and conferences. Additionally, he chairs the IEEE Hong Kong Joint Chapter of RAS/CS and is an IEEE Senior Member.