The 16th International Conference on Intelligent Robotics and Applications (ICIRA 2023)

July 5-7, 2023 in Hangzhou, China

ICIRA 2023 Special Session Proposal

Title of the Proposal:

Human-centric technologies for seamless human-robot collaboration

Technical Outline of the Session and Topics:

Human-robot interaction (HRI) is playing an increasingly important role in robotic applications in a variety of fields, such as industry, medical care, and education. It can effectively combine human experience and decision-making ability with high precision and strong operability of robots to complete complex tasks together. However, current HRI solutions are still far from exploiting the full potential. Towards seamless human-robot collaboration scenarios, Artificial Intelligence (AI) has the potential to enhance all the components of a HRI technology, such as human sensing, activity recognition and prediction, and robotic control and decision-making. For instance, human-robot collaboration frameworks can replicate human abilities and transfer human skills to robots, and smart devices can strengthen human physical capabilities. This Session will focus on recent progress and multi-disciplinary technologies with practical potential and far-reaching real-world implications. We welcome researchers to share their latest research findings from both academia and industry, including but not limited to the following:

- *Safe and human-aware physical interaction*
- *Multi-modal human perception*
- *Activity and intention recognition*
- *Human-centric interface design*
- *Smart devices for human capability enhancement*
- *Representation of human states and actions*
- *Human-aware planning and control*
- *Role allocation in human-robot teams*
- *Transfer of human skills via imitation learning*

Contact details of the Session Organizers

- *Organizer 1: Qing Gao, Sun Yat-sen University, gaoqing2@mail.sysu.edu.cn*
  Qing Gao, Dr. *received the Ph.D. degree in mechatronic engineering from the State Key Laboratory of Robotics, Shenyang Institute of Automation (SIA), Chinese Academy of Sciences (CAS), Shenyang, China, in 2020. Currently, he*

is an Associate Professor with Sun Yat-sen University. His research interests include human–robot interaction and machine vision.

- *Organizer 2: Xin Zhang, Shenyang Institute of Automation, Chinese Academy of Sciences, zhangxin@sia.cn*
  Xin Zhang, Dr. *received the Ph.D. degree in mechatronic engineering from the State Key Laboratory of Robotics, Shenyang Institute of Automation (SIA), Chinese Academy of Sciences (CAS), Shenyang, China, in 2019. Currently, he is an Associate Professor with SIA, CAS. Since April 2022, he is a Visiting Scientist with the Italian Institute of Technology, Genova, Italy. His research interests include vehicle-manipulator systems, human–robot interaction, and machine vision. Dr. Zhang was the recipient of the Dean's Award for Excellence of CAS and the CAS Outstanding Doctoral Dissertation. He serves as an Associate Editor of Frontier in Robotics and AI.*

- *Organizer 3: Edoardo Lamon, Italian Institute of Technology and University of Trento, edoardo.lamon@iit.it*
  Edoardo Lamon, Dr. *received the Ph.D. degree in robotics and automation from the University of Pisa, Pisa, Italy, in 2021. He is currently a researcher at the University of Trento, Trento, Italy and at the Italian Institute of Technology, Genova, Italy, where he is contributing to several research and technology-transfer projects, such as SOPHIA, Ergo-Lean, and CONCERT. Dr. Lamon was awarded as finalist for the European best thesis in robotics at the Georges Giralt PhD Award 2022, as finalist for the best paper award on mobile manipulation at IROS 2022, for the best paper at I-RIM (2021 & 2019), and for the MECSPE Solution Award 2020. His interests lie in the intersection of human-robot collaboration, artificial intelligence, robot control and learning, with the aim of boosting robotics in human-populated environments.*

- *Organizer 4: Gokhan Solak, Italian Institute of Technology, gokhan.solak@iit.it*
  Gokhan Solak, Dr. *received an M.Sc. degree in computer engineering from Istanbul Technical University, Istanbul, Turkey, in 2017. He obtained his Ph.D. degree from computer science at Queen Mary University of London, UK, in 2022. Currently, he is working as a postdoctoral researcher at the Italian Institute of Technology, Genova. His research interests include human-robot interaction, robotic grasping and manipulation, robot learning, and tactile sensing.*