Proposal for a Special Session at IEEE RO-MAN 2024

Social Human-Robot Interaction of Human-care Service Robots:
Exploring Foundation Models in Social Human-Robot Interaction

Aim and Scope of the Special Session

Service robots have transcended the introductory phase and are now widely deployed, playing a pivotal role in enhancing our daily lives. Marking the fourth installment of this influential special session at RO-MAN 2024, we continue our commitment to advancing the field of social human-robot interaction. This year, we are placing a special emphasis on the application of foundation models in social human-robot interactions, a rapidly evolving area that promises to revolutionize our understanding and implementation of socially intelligent robots. The special session aims to foster a pioneering exploration into how foundation models are reshaping the landscape of social interactions between humans and robots. Our discussion will encompass:

1. Innovative Technical Implementations: Delving into how foundation models enhance the capabilities of social robots for more natural and effective human-robot interactions.
2. Design, Functionality, and Behavior: Examining the impact of foundation models on the design and functionality of service robots, ensuring they are user-friendly and exhibit advanced social intelligence.
3. Human Behavioral Insights and Expectations: Understanding the human side of the equation — how people perceive, interact with, and adapt to robots powered by foundation models.

In addition to these focus areas, we also warmly welcome papers addressing general issues in social human-robot interaction. This broadens our scope to include a wide range of topics and perspectives, enriching the discourse and development in the field.

We invite experts and enthusiasts from diverse fields, including human-robot interaction design, AI, social psychology, and robotics, to contribute to this dynamic discussion. This session will serve as a platform for sharing innovative ideas and fostering interdisciplinary collaboration, ultimately contributing to the seamless integration of service robots into society.

Topics of interest include but not limited to:

- *Adaptive Conversation Models for Human-Robot Interaction*
- *Foundation Models for Emotional Intelligence in Robots*
- *Cross-modal Understanding for Enhanced Social Interaction*
- *Personalization and User Profiling with LLMs*
- *Ethical Considerations and Bias Mitigation in LLM-driven HRI*
- *Interactive Learning and Knowledge Expansion in HRI*
- *Social perception and context awareness*
- *Short/long-term behavior recognition*
- *Social expression and interactive behavior*
- *Social task modeling and management*

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- *Social grasping and navigation skills*
- *Social humanoid robot design*
- *Human-robot interaction design*
- *Emotion recognition and model design*
- *Dialogue based interaction*
- *User evaluation*
- *Applications such as healthcare, receptionist, education*

Organizers

Minsu Jang, Dr.

Co-Chair, Electronics and Telecommunications Research Institute, South Korea
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Short Bio: Minsu Jang, a Principal Researcher at the Electronics and Telecommunications Research Institute, and an Associate Professor at the University of Science and Technology, South Korea, specializes in advancing adaptive and open-world intelligence for social and service robots. His research aims to foster flexible and natural interactions between humans and robots, contributing to the development of robots that not only perform tasks efficiently but also learn effectively in real-world scenarios. He plays an active role in the Korea Robotics Society and in the academic community, organizing workshops and editing for robotics journals.

Ho-Seok Ahn, Prof.

Co-Chair, University of Auckland, New Zealand
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Short Bio: Ho Seok AHN is a senior lecturer, which is equivalent to Associate Professor at major universities abroad, at the Department of Electrical, Computer and Software Engineering, University of Auckland, New Zealand. He received his Ph.D. degree in Electrical Engineering and Computer science from Seoul National University, Republic of Korea, in 2010. He was a senior researcher at Korea Institute of Industrial Technology (KITECH), Republic of Korea, from 2010 to 2012. He was a research scientist at Intelligent Robotics and Communication Laboratories, Department of Ambient Intelligence, Advanced Telecommunications Research Institute International (ATR), Japan, from 2012 to 2013. He was a Section Chair of the IEEE New Zealand North Section in 2019-2020, and currently Chapter Chair of the IEEE NZ Robotics and Automation Chapter. His research interests include social robots, cultural robots, Human-Robot Interaction, affective computing, artificial emotional systems, healthcare robots, intelligent interactive systems, facial robots, android robots, humanoid robots, intelligent service robots, and modular robot systems

Hastice Gunes, Prof.

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Short Bio: Hatice Gunes is a Full Professor of Affective Intelligence and Robotics and the director of the AFAR Lab at the University of Cambridge's Department of Computer Science and Technology. Her expertise is in the areas of affective computing and social signal processing cross-fertilising research in multimodal interaction, machine learning, and human-robot interaction. She has published over 175 papers in these areas (h-index=39, 8400+ citations), and has served as an Associate Editor for IEEE Trans. on Affective Computing, IEEE Trans. on Multimedia, Image and Vision Computing Journal, and Int'l Journal of Social Robotics, and has guest edited many Special Issues. Prof Gunes is the former President of the Association for the Advancement of Affective Computing (AAAC), was the General Co-Chair of IEEE ACII'19, and the Program Co-Chair of ACM/IEEE HRI'20 and IEEE FG'17. She was the Chair of the Steering Board of IEEE Trans. on Affective Computing (2017-19) and was a member of the HRI Steering Committee (2018-21). She has been awarded the prestigious EPSRC Fellowship to investigate adaptive robotic emotional intelligence for wellbeing (2019-25) and was named a Faculty Fellow of the Alan Turing Institute - the UK's national institute for data science and artificial intelligence (2019-21).

Tony Belpaeme, Prof.

Co-Chair, Ghent University, Belgium
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Short Bio: Tony Belpaeme is a professor of artificial intelligence and robotics at Ghent University in Belgium and the University of Plymouth in the UK. He is interested in how humans and robots can interact socially and communicate through language. He has led several research projects on social robotics, cognitive robotics, and robot-assisted therapy for children with autism spectrum disorder. He is also the co-editor of the book Human-Robot Interaction: An Introduction, published by Cambridge University Press in 2020. He has received various awards and recognitions for his work, such as the IEEE RAS Early Career Award and the EPSRC Impact Acceleration Award. He is an active member of the scientific community and serves as an associate editor for several journals and conferences. He enjoys sharing his passion for robotics with the public through media appearances, exhibitions, and outreach events.

Elmira Yadollahi, Dr.

Co-Chair, KTH Royal Institute of Technology, Sweden
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Short Bio: is a Postdoctoral fellow at the Division of Robot, Perception, and Learning at KTH Royal Institute of Technology, Sweden. She obtained her PhD in 2021 in Robotics and Computer Science from École Polytechnique Fédérale de Lausanne (EPFL), Switzerland and Instituto Superior Técnico, Portugal. She is starting as a Lecturer (equivalent to an Assistant Professor) at Lancaster University in the UK.
Her research tackles topics on explainability in human-robot interaction, educational child-robot interaction, robot cognitive development, and assistive robotics. She is an associate editor of the International Journal of Child-Computer Interaction (IJCCI) and has served as a guest editor at the Interaction Studies Journal. She served as co-chair of the Research and Design Challenge Track at the

ACM Interaction Design and Children Conference (IDC) in 2023 and 2024. She has co-organized several workshops at HRI, ICSR, and IDC conferences.

Kristiina Jokinen, Dr.

Co-Chair, National Institute of Advanced Industrial Science and Technology, Japan
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Short Bio: Kristiina Jokinen is Senior Researcher at AIRC (Artificial Intelligence Research Center), AIST Tokyo Waterfront, Japan. After her PhD from UMIST, Manchester she was JSPS Research Fellow at NAIST in Japan and an Invited Researcher at ATR Research Labs in Kyoto. She was Nokia Foundation Fellow at Stanford University in 2006, NICT Visiting Professor at Doshisha University in 2009-10, and is a Life Member of Clare Hall at University of Cambridge. Before joining AIRC, she was Professor and Project Manager at University of Helsinki and at University of Tartu. Her research focuses on spoken dialogue systems, multimodal communication (speech, gaze, gesturing), and human-robot interaction. She led the development of WikiTalk, a Wikipedia-based talking robot information system, and has been Principal Investigator in multiple international projects. She has published four books, and organized several international workshops including the northernmost spoken dialogue conference IWSDS 2016 in Lapland.

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- General Chair, RO-MAN 2023
- Special Session Co-Organizer RO-MAN2021, RO-MAN2018
- Steering Committee, HRI (2017~2020)
- Financial Chair, HRI 2019
- Associate Editor, ICRA 2018
- Organized Session Chair, ICCAS 2016
- Organized Session Chair, RO-MAN 2013

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Short Bio: Director, Principal Researcher, Social Robotics Research Lab., ETRI

- Special Session Co-Organizer, RO-MAN 2021 ~ 2023
- Special Session Organizer & Chair, UR 2023
- Workshop Co- Organizer, ICSR 2021
- Industry Chair, URAI 2017

- Exhibition Chair, RO-MAN 2013
- Video/Poster Chair, URAI 2012

Tentative Speakers

1. Resolving ambiguity in LLM-based generation of social task plans for human-robot interaction, Hanna Lee et al., Korea Institute of Robotics & Technology Convergence, South Korea
2. A Sign Language Recognition System with Pepper, Lightweight-Transformer, and LLM, JongYoon Lim et al., University of Auckland, New Zealand
3. Robot Task Planning by Asking Questions, Minsu Jang et al., Electronics and Telecommunications Research Institute, South Korea
4. Implementation and Evaluation of a Memory Management System based on Long-Term Memory Theory for Human Robot Interaction, Hyeonuk Bhin et al., Korea Institute of Science and Technology, South Korea
5. Two Approaches of Lip Reading to Assist Sign Language Understanding, Caleb Simmons, Shameer Prasad, Jong Yoon Lim, Bruce A. MacDonald, and Ho Seok Ahn, New Zealand