

Proposal of Special Session

1. Title

Designing Neuroaffirming Robotic Teammates for Human-Centric Workplaces

2. Aims and Scope

As research and practice move toward Industry 5.0, robotics is increasingly expected to support human-centered collaboration rather than automation alone. Significant advances have been made in physical safety, ergonomics, and task efficiency. By contrast, comparatively little attention has been paid to designing systems that accommodate differences in perception, attention, communication, and reasoning. Conventional Human–Robot Interaction (HRI) models often assume a neurotypical reference user, embedding standardized expectations about social signaling, communication styles, and sensory tolerance. These assumptions can limit accessibility and participation for a substantial segment of the workforce, including neurodivergent individuals (e.g., Autistic people, individuals with ADHD, dyslexia, and related cognitive profiles), who represent a growing proportion of working-age adults.

This special session brings together research on neuroaffirming HRI in professional and industrial contexts. Rather than framing neurodivergence through a medical or deficit-based lens, the session foregrounds design approaches that treat cognitive diversity as a normal and valuable dimension of human variation. The focus is on how robots and AI-based systems can support autonomy, self-determination, and meaningful participation for neurodivergent adults—beyond roles limited to supervision, accommodation, or therapeutic use. Contemporary AI techniques play a central role in this discussion, particularly in enabling adaptive and inclusive interaction in current and future work settings. For example, Large Language Models and other types of Generative AI may support varied interaction styles (e.g., explicit versus implicit communication), while perception and planning systems can be designed to recognize diverse social and behavioral signals. At the same time, these approaches raise critical questions about data representation, training assumptions, and the risk of reinforcing existing workplace norms.

The session adopts an interdisciplinary perspective, bridging technical HRI research with user-centered design, AI design & usage, accessibility studies, and ethics. Contributions addressing both system-level innovation and empirical investigations of user experience are particularly encouraged. Topics of interest include, but are not limited to:

- User requirements and design studies: Empirical research (e.g., interviews, surveys, participatory design) examining the needs, preferences, and priorities of neurodivergent workers interacting with industrial or service robots.
- AI for cognitive accessibility: Methods leveraging AI (e.g., generative models, interpretable planning, adaptive interfaces) to transform complex, ambiguous, or socially implicit tasks into more structured and predictable workflows.
- Sensory-aware robotics: Robotic systems that monitor and modulate environmental factors such as noise, lighting, movement, or proximity to reduce sensory overload in shared work environments.
- Supporting agency and self-determination: Design frameworks and control paradigms that prioritize user choice, transparency, and autonomy in human–robot collaboration.
- Beyond normative social interaction: Investigations informed by concepts such as the Double Empathy Problem, examining how robots can interpret diverse communicative and social behaviors without framing them as errors or disengagement.
- Ethics of workplace AI: Critical perspectives on privacy, data governance, fairness, and the ethical implications of modeling cognitive diversity in employment-related technologies.

3. Tentative speakers

Please provide a list of prospective contributing authors and tentative titles. Special Sessions are normally expected to have 4 to 6 papers. Invited speakers or session-related demonstrations (such as renowned speakers or industrial talks) could be a part of the Special Session.

Note: We have identified the following leading researchers whose expertise in neurodiversity, adaptive HRI, and social signal processing aligns closely with the session theme. Upon acceptance of our proposal, we will invite these experts to submit their recent work, specifically encouraging contributions that bridge the gap between social robotics and adult or industrial applications. In parallel, we will actively reach out to the broader academic community to encourage a diverse range of submissions.

1. Hwajung Hong, Professor of Industrial Design, Korea Advanced Institute of Science & Technology
2. Brian Scassellati, Professor of Computer Science, Yale University
3. Nilanjan Sarkar, Professor of Electrical and Computer Engineering, Vanderbilt University
4. Adriana Tapus, Professor of Robotics and Computer Vision, ENSTA Paris (Institut Polytechnique de Paris)
5. Maja Matarić, Professor of Computer Science, Neuroscience, and Pediatrics, University of Southern California
6. David Feil-Seifer, Professor of Computer Science and Engineering, University of Nevada, Reno
7. Chien-Ming Huang, Assistant Professor of Computer Science, Johns Hopkins University
8. Laurent Itti, Professor of Computer Science and Psychology, University of Southern California

9. Yuichiro Yoshikawa, Professor of Engineering Science, Professor of Engineering Science, Osaka University

4. Organisers and biographies

Please provide a short bio-sketch of the session organisers including their experience in the topic of the Special Session

Sunwook Kim, PhD

Research Associate Professor, Virginia Tech

Bio: Sunwook Kim is a Research Associate Professor in Industrial and Systems Engineering at Virginia Tech. His research investigates the impact and adoption of emerging technologies (e.g., exoskeletons and collaborative robots) and inclusive work design for promoting neuro-inclusive workplaces.

Email: sunwook@vt.edu

Myounghoon Jeon, PhD

Professor, Virginia Tech

Bio: Myounghoon Jeon is a Professor in Industrial and Systems Engineering and Computer Science (by courtesy) at Virginia Tech. His Mind Music Machine Lab conducts research on assistive robotics for people with autism spectrum disorder.

Email: myounghoonjeon@vt.edu

Chung Hyuk Park, PhD

Associate Professor, George Washington University

Bio: Dr. Park is an Associate Professor in Biomedical Engineering at The George Washington University. His Assistive Robotics and Tele-Medicine (ART-Med) Lab. conducts research on human-robot interaction (HRI) and machine learning (ML) with special focuses on assistive robotics, telemedical robotics, haptics, computer vision, and multi-modal communications.

Email: chpark@gwu.edu

Zhi Zheng, Ph.D.

Assistant Professor, University of Notre Dame

Bio: Zhi Zheng is an Assistant Professor in Electrical Engineering at the University of Notre Dame. Her research focuses on human-machine interaction (HMI). Specifically,

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her work explores the fundamental mechanisms and applications of HMI in the contexts of developmental disabilities, aging, and substance use. Her research is collaborative, involving partnerships with researchers in psychology, medicine, and social sciences.

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