

## 1. Final Session Title

LLM-Enabled Human–Robot Communication, Reasoning, and Its Applications

## 2. Organizers and Contacts

Sławomir Kciuk

Professor, Silesian University of Technology, Poland

Email: [slawomir.kciuk@polsl.pl](mailto:slawomir.kciuk@polsl.pl)

Łukasz Sobczak (Corresponding Organizer)

Assistant Professor, Institute of Theoretical and Applied Informatics,

Polish Academy of Sciences, Poland

Email: [lsobczak@iitis.pl](mailto:lsobczak@iitis.pl)

## 3. Short Description of Aims and Scopes

Recent advances in Large Language Models (LLMs) are reshaping the way humans and robots communicate, collaborate, and share decision-making in real-world environments. Language is increasingly becoming a central interaction modality, enabling robots to understand complex instructions, explain their actions, and adapt behavior through dialogue. However, integrating generative language models into embodied robotic systems raises critical challenges related to grounding, safety, transparency, and ethical responsibility.

This Special Session focuses on LLM-enabled human–robot interaction, with an emphasis on grounding natural language in perception, spatial reasoning, task context, and interaction history. Rather than treating language as a simple command interface, the session explores how dialogue can support continuous, context-aware, and human-centered interaction. Topics include language-guided navigation and manipulation, multimodal communication combining language, vision, and spatial understanding, as well as socially appropriate robot behavior in shared environments such as homes, hospitals, and industrial settings.

A distinctive aspect of this session is its strong human-centered and ethical perspective. Contributions are encouraged to address explainability, trust, responsibility attribution, and interaction-aware safety in LLM-driven robotic systems. By bringing together researchers from robotics, HRI, and AI, this session aims to establish language as a unifying interface for trustworthy, transparent, and socially aware robotic intelligence, contributing to the future of natural human–robot collaboration.