Special Session Proposal for the Polish Control Conference 2026

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Proposed Session Title: "Robot Learning"

Abstract:

The session invites submissions that explore the intersection of robotics and machine learning. As robotic systems increasingly rely on data-driven methods, the limitations of current AI techniques are becoming more apparent. This workshop seeks to address these challenges by fostering collaboration between the robotics and machine learning communities.

Description:

This session will focus on the crucial role of learning in robotic systems and how it interacts with broader areas of robotics. We welcome original, high-quality research that advances the state of the art in robot learning, with the goal of building more capable, adaptable, and intelligent robots. Topics of interest include, but are not limited to:

- Representation learning for robotic perception and control
- Foundation models and general-purpose knowledge systems for robotics
- Imitation learning, including behavioral cloning and inverse reinforcement learning
- Reinforcement learning for real-world robot control
- Model-based and model-free learning approaches in robotic decision-making
- Physics-informed Neural Networks to Model and Control Robots
- Integrating learning with classical planning techniques
- Probabilistic methods and uncertainty modeling in robotics
- Data generation and simulation for training robot learning systems
- Learning for tasks and motion planning
- Multimodal perception, sensor fusion, and robot vision
- Human-robot interaction, including instruction via language, gesture, or other interfaces
- Learning-driven design and optimization of robotic hardware
- Safe learning methods and safety-critical robotic systems
- Applications in manipulation, navigation, locomotion, autonomous driving, aerial robotics, and more
- Learning-centric robotic systems, hardware, and sensor platforms