

Call for Papers

Special Issue on “Navigating the Multi-Robotic Frontier with Reinforcement Learning”

In recent years, the intersection of multiple autonomous robotics and cutting-edge machine learning techniques has sparked unprecedented advancements in the field. This special issue aims to explore and showcase the synergies between reinforcement learning and the design and control of multi-robotic systems. This convergence holds immense potential for addressing complex challenges in various domains, ranging from industrial automation and logistics to search and rescue operations and environmental monitoring. The landscape of autonomous robotics has evolved rapidly, with the deployment of multiple robotic agents becoming increasingly common. This paradigm shift introduces a new set of complexities, including the need for efficient coordination, collaboration, and decision-making among heterogeneous robotic entities. Reinforcement learning, a subfield of machine learning concerned with training agents to make sequential decisions, emerges as a promising avenue to enhance the autonomy, adaptability, and overall performance of multiple robotic systems operating in dynamic and uncertain environments. This special issue aims to bring together researchers, practitioners, and experts from both the reinforcement learning and robotics communities to explore the state-of-the-art in this converging domain. By delving into the latest research findings, methodologies, and practical applications, the special issue will provide a comprehensive view of how reinforcement learning techniques can be tailored and extended to address the unique challenges posed by multi-robotic systems. Contributions are invited to cover a wide spectrum of topics, including but not limited to reinforcement learning algorithms for multi-robot coordination, communication strategies, task allocation, and robust decision-making in the context of multiple autonomous robotic platforms. Through this collaborative exploration, we seek to advance our understanding of the challenges and opportunities at the frontier of multiple autonomous robotics, fostering a deeper integration of reinforcement learning techniques into the design, control, and optimization of intelligent multi-robotic systems. Researchers and practitioners are encouraged to submit their original contributions, thereby contributing to the collective knowledge that will shape the future of autonomous robotic systems operating in diverse and dynamic environments.

Keywords:

- Active learning, Adaptive control
- Artificial intelligence, Autonomous exploration, Autonomous navigation
- Deep reinforcement learning
- Human-robot interaction
- Multi-agent reinforcement learning
- Non-parametric reinforcement learning
- Robotics
- reinforcement learning
- Sensor fusion
- Sequential decision-making
- Simulation-to-real-world transfer
- Trajectory optimization
- Unsupervised learning

Submission Guidelines: Submitted articles must not have been previously published or currently submitted for publication elsewhere. All submissions are subject to the IEEE System Journal’s peer-review procedures. The journals must be submitted online at <https://mc.manuscriptcentral.com/ieee-sj>. The author guidelines can be found at <https://ieeesystemsjournal.org/authorinstructions/>. Select the paper type "**SI: Navigating the Multi-Robotic Frontier with Reinforcement Learning**" upon submission to ensure that the article is considered for this special issue. Authors must also mention the same in their submission cover letter.

Important Dates:

Submission deadline: June 30, 2024

First round of review: July 31, 2024

Second round of review: September 30, 2024

Final decision: October 15, 2024

For further information, please contact any of the Guest Editors.

Guest Editors

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