

IEEE Transaction on Cognitive and Developmental Systems



Special Issue on

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Embodied AI in Indoor Robotics: Bridging Perception, Interaction, and Autonomy

Embodied AI systems, with their ability to perceive, interact, and autonomously navigate the real world, are poised to revolutionize various fields, including household robotics. With the rapid advancements in deep learning and reinforcement learning in the field of robotics, particularly the groundbreaking progress in large language models, the prospects of Embodied AI methods making robots integrate into everyday life, offering assistance with complex daily tasks have become increasingly promising. These systems not only integrate advanced technologies like computer vision and natural language processing but also embody the principles of cognitive development, learning, and adaptation. This special issue aims to explore the intersection of embodied AI with cognitive and developmental systems, focusing on how robots can learn and evolve through interactions with their environment, akin to human cognitive development.

The objective of this special issue is to explore the recent advancements and challenges in Embodied AI methods and their applications in household robotics, with a particular focus on how these systems can replicate the cognitive processes and developmental trajectories observed in humans and animals.

TOPICS: This special issue will focus on (but not limited to) the following topics:

- Cognitive Development in Robots: How robots can learn and adapt through experiences, mimicking human cognitive growth
- Neuromorphic Cognition: Contributions that explore the emulation of neural structures and processes in robots, aiming to replicate the efficiency and adaptability of biological brains.
- Long-term task planning for robots
- Robot navigation and manipulation
- Multimodal perception and sensor fusion
- Reinforcement learning and transfer learning in robotics.
- Human-robot interaction with natural language processing (NLP) and dialogue systems
- Application of large language models in robotics
- Survey/Benchmark on Embodied AI for indoor robotic
- Simulation to real transfer learning algorithms

SUBMISSION GUIDELINES: Manuscripts should be prepared according to the guidelines in “Submission Guidelines” of the IEEE Transactions on Cognitive and Developmental Systems in <https://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=7274989>. Submissions should be done through the journal submission website: <https://mc.manuscriptcentral.com/tcds-ieee>, by selecting the Manuscript Type of “SI: Embodied AI in Indoor Robotics: Bridging Perception, Interaction, and Autonomy”. Submitted papers will be reviewed by domain experts. Submission of a manuscript implies that it is the authors’ original unpublished work and is not being submitted for possible publication elsewhere.

IMPORTANT DATES:

- Manuscript Due: May 31, 2024
- First Notification: June 30, 2024
- Revision Due: July 31, 2024
- Final Notification: September 30, 2024
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