



[CFP] Special issue on Movement Sciences in Cognitive Systems IEEE Transactions on Cognitive and Developmental Systems

Over the past decades, the robotics communities have created computationally efficient mathematical tools for the study, simulation, and optimization of movements of articulated bodies. These techniques are being applied to increasingly complicated mechanical structures such as prosthetics and artificial systems in rehabilitation and sports training. Such formalism for quantitative biological motion analysis and synthesis is enabling broader applications in fields such as medical diagnosis, physical training monitoring and feedback, animation, ergonomic analysis and design, and assistive robots and devices.

Learning and adapting to changing environments are challenging for cognitive systems. It is conceivable that the biological principles that underpin these adaptive and learning behaviours in animals or humans will inspire new robotic technology and the design of cognitive systems. To enable more agile and natural behaviours of these systems, it is useful to observe and analyze the mechanisms of the perception and action of biological systems. Complex brain circuitry is responsible for the movement, which ultimately controls muscle contraction. In humans and other mammals, the organization of neural structures including the spinal cord, cerebral cortex, basal ganglia, and cerebellum may be a key role to allow the adaptation and flexibility of movements

This special issue on movement sciences in cognitive systems is primarily concerned with the implications of different computational aspects of movement sciences in developing intelligent systems. In cognitive systems, results and methodologies created from human or animal motion analysis in domains such as biomechanics, neuroscience, computer graphics, and computer vision are rapidly being employed in different themes, such as rehabilitation robots, ergonomic designs and assistive robots.

This special issue will highlight the scientific findings from movement neuroscience, algorithms developed for the analysis, simulation, and optimization of articulated body movement and their applications in learning and interpreting complex structures or movements in cognitive systems.

The primary list of topics (but is not limited to): Movement analysis in cognitive systems; Movement synthesis in cognitive systems; Sensory-motor learning in cognitive systems; Goal-directed movements in cognitive systems; Environmental-driven scaffolding; Movement neurosciences-inspired control; Modelling of human and animal behaviour movements; Reinforcement learning and deep reinforcement learning in movement control; Biomechanical analysis in cognitive systems; Interactive and affective motion design in cognitive systems

Submission: 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 “Movement Sciences in Cognitive Systems” and clearly marking “Movement Sciences in Cognitive Systems” in the comments to the Editor-in-Chief. 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.

Call for papers: July 2022; **Paper submission deadline:** 6 January 2023

Notification of acceptance: March 2023; **Deadline revised versions:** 31st May 2023

Final notification: 30th June 2023; **Camera-ready deadline:** 31st July 2023

Expected publication date: September 2023

Guest Editors

Junpei Zhong, The Hong Kong Polytechnic University, Hong Kong; **Ran Dong**, Tokyo University of Technology, Japan; **Soichiro Ikuno**, Tokyo University of Technology, Japan; **Yanan Li**, University of Sussex, UK; **Chenguang Yang**, University of the West of England, UK

Contact: joni.zhong@polyu.edu.hk