Special Issue

Actuators in Multi-Agent Systems: Advanced Applications for Robotics and Autonomous Vehicles

Message from the Guest Editor

This Special Issue invites original research and review articles addressing the design, modeling, and control of actuators tailored for multi-agent systems. Topics of interest include smart, soft, and bio-inspired actuators; energy-efficient and high-performance actuation; fault-tolerant and reconfigurable actuator systems; and actuator–sensor integration for cooperative tasks. Advanced control strategies, including distributed, learning-based, and adaptive approaches, as well as real-time implementation and experimental validation, are particularly encouraged. Relevant applications span swarm robotics, cooperative manipulation, and unmanned aerial, ground, and marine vehicles, as well as autonomous and connected transportation systems. By bringing together contributions from robotics, mechatronics, and control engineering, this Special Issue aims to highlight how advances in actuation technologies can enhance autonomy, coordination, and scalability in next-generation multi-agent robotic systems.

Guest Editor

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About the Journal

Message from the Editor-in-Chief

We are just entering the Next Wave of Technology (NWT) where actuators will play the same role as the computer chip did for computers/social media approximately four decades ago. Just in the U.S., production of $1 trillion year of electromechanical systems (vehicles, orthotics, manufacturing cells, freight trains, aircraft, etc.) will be impacted by the NWT, all driven by actuators. Five key trends can be found for the future perspectives: “Performance to Reliability”, “Hard to Soft”, “Macro to Nano”, “Homo to Hetero” and “Single to Multi functional”. We invite papers that primarily impact these economic sectors; those illustrating basic scientific principles are also welcome.

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