



MECHATRONICS

Call for Papers

Focused Section on

Smart Actuation and Multi-Modal Sensing Systems for Mechatronics Applications, Beyond the Human Capabilities

In recent years, the number of research groups around the world working on innovative actuation systems (e.g., soft/compliant robots, reconfigurable systems) and multi-modal sensor systems (e.g., tactile, proximity, inertial, vision) is continuously growing. This focused section will be a stage for researchers, engineering, and industrial practitioners to propose novel mechatronics solutions integrated into robotic system that are capable of autonomously executing tasks typically hazardous, dirty, and boring for humans, or into human-centric solutions where the robot supports the human in complex tasks. To reach this objective, *novel actuation and multi-modal sensor systems*, with functionalities and features *also beyond human capabilities*, will play a fundamental role in a range of innovative applications in key sectors, from service to production, from healthcare to domestic use. Furthermore, these solutions must be able to guarantee the responsiveness, intelligibility, and adaptability necessary for natural human-robot, as well as robot-robot, collaboration and interaction. The close interaction between actuation and sensing also allows the implementation of algorithms for quick detection and response to failures in different embodiments of mechatronics systems. In this direction also move several players (e.g., EU Commission and single countries) by funding new research and innovation projects and opening calls for new proposals. Particular focus shall be placed on multidisciplinary methodological frameworks, hardware development for real-world applications and out-of-lab experiments. Manuscripts should contain both theoretical and experimental results and they will be subject to the normal TMECH review procedures. The topics of interest within the scope of this Special Section include, but not limited to, the following:

- Human-centric robotics.
- Multi-modal perception.
- Sensing and perception for grasping and manipulation.
- Smart-material-based actuation and sensing systems.
- Sensor fusion techniques.
- Integrated robot design for natural human-machine interaction.
- High-density/distributed actuation and sensing.
- Sensory-motor integration.
- Shared autonomy of redundancy control in human-robot interaction.
- Synergy of data and robotics.

Manuscript Preparation:

Papers must contain original contributions and be prepared in accordance with TMECH standards. Instructions for authors are available online at: <http://www.ieee-asme-mechatronics.org>

Manuscript Submission:

Manuscripts should be submitted online at: <https://mc.manuscriptcentral.com/tmech-ieee>. The cover letter should report the following statement: *"This paper is submitted for possible publication in the Focused Section on Smart Actuation and Multi-Modal Sensing Systems for Mechatronics Applications, Beyond the Human Capabilities"*. All manuscripts will be subjected to the regular TMECH peer review process. Any questions relating to this focused section can be sent to one of the Guest Editors below via emails.

Important Dates:

Paper Submission	Aug 1 st , 2024
Completion of First Review	Oct 1 st , 2024
Submission of Revised Papers	Nov 15 th , 2024
Completion of Final Review	Jan 15 th , 2025
Submission of Final Manuscripts and Copyright Forms	Feb 28 th , 2025
Publication	April, 2025

Guest Editors:

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