

## Human-in-the-loop control of haptic devices: now and the future

**SPECIAL SESSION** during the 6th International Conference on System-Integrated Intelligence. Intelligent, flexible and connected systems in products and production (SYSINT 2022) which will be held in Genova, Italy, 7<sup>th</sup>-9<sup>th</sup> September 2022 (<https://sysint-conference.org/>).

### Call for papers

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Building haptic interfaces for human-in-the-loop applications is a scientific and technological challenge, which requires finding ways to intuitively channel sensorimotor information via afferent and efferent pathways of the human nervous system. In such applications, the artificial agent for touch can be intended as a direct extension of a human body (eg teleoperation) or as a device to be perceived as a part of the body (eg prosthetics). New system perspectives are needed for the development of novel-generation haptic interfaces.

Scope of this Special Session is to define a promising road-map towards human-in-the-loop control of future haptic interfaces suitable to manage a variety of possible behaviors and tasks in different contexts. More specifically, the Special Session aims at highlighting novel advancements towards filling the gap between the development of haptic technologies and human-in-the-loop application requirements.

This Special Session focuses on topics in the area of, but not restricted to:

- Soft bio-inspired designs for intrinsically compliant bionic limbs enabling manipulation dexterity and open issues for their effective integration into human-in-the-loop systems
- Algorithms, approaches and systems to exploit the abundance of tactile data generated by the haptic device within the local feedback loop and/or to be conveyed to the user as haptic feedback.
- Development of intelligent sensor systems eg for human intent detection or environment feature detection
- Feedback interface: robustness, invasiveness, biomimetic-neuromorphic solutions or possible alternatives, ...
- Fruitful interaction between mechatronics and sensorimotor loop
- Semi-autonomy – Potential interference between semi-autonomy and embodiment

According to the quality of the contributions, organizing a Special Issue on IEEE/ASME Transactions on Mechatronics is being considered.

### Invited speaker

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**Gerald Loeb (Professor of Biomedical Engineering and Director of the Medical Device Development Facility, University of Southern California, Los Angeles, USA)**

Self-Organizing Middleware for Haptically Enabled Robots

### Important dates

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+ **May 15, 2022 (extended) – Paper Submission deadline** – Papers will be submitted following the standard submission process <https://sysint-conference.org/call-for-papers/>. The name of the Special Session needs to be specified during submission.

+ **June 8, 2022 (extended) – Notification of Acceptance**

+ **July 1, 2022 – Camera Ready deadline**

### Organizers

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