

Invited track on:

“Mechatronics tools and control related to robotic manipulation”

Organizers:

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Track abstract:

Robotic manipulation consists in the use of mechatronic devices, for instance grasping tools together with robot arms, to perform manipulation or grasping of objects. Applications can be found in macro and in miniaturized scales, for instance: automotive industry, medical surgery and assistance, industry of future, or military. Many challenges are observed in robotic manipulation from the design point of view to the control one: limited number of sensors, difficulty to integrate appropriate actuators, modeling of complex system, architecture. On the other hand, we witness the last decade novel scientific stimuli: robotic manipulation in presence of or with human, tasks in harsh - extreme or tiny environment, manipulation tasks with small objects where surface forces are more important than the weight, more and more complex objects shape, deformability of the objects, more and more dexterity to be reached, multi-fingered manipulation, grasping stability, manipulation based on mobile robotics platform... Hence new advanced modeling, control techniques and related tools have also been raised for the mechatronic devices that equip these robots and for these latter as well.

This open invited track is to create the opportunity of bringing together the researchers from the communities of mechatronics, robotics and control to propose innovative solutions and methodologies to succeed the tasks of manipulation. The expected papers are related to new design and development of mechatronic systems for and to control in robotic manipulation in general.

Technical Committee: *This invited track is supported by the IFAC T.C.4.2-Mechatronic Systems. The invited track can also touch the IFAC T.C.4.3-Robotics activities.*

Keywords: advanced methodologies of control, stability analysis, grasp quality, trajectory tracking, force control, modeling, estimation, identification, actuators, sensors, robot hands.

The keywords listed above should be referred but not limited to: autonomous, collaborative or tele-manipulation, assembly, grasping, Human-Robot interaction, miniaturized robotics, (macro)robotics. Simulation and/or experiments are strongly encouraged in the submitted papers.

Contribution: *contribution can be regular papers (6 pages), surveys (up to 12 pages), or discussion papers (2 to 4 pages).*

Invited track submission code: **a8ku8**

Deadline of papers (regular, surveys): **October 31, 2022**

Deadline of discussion papers: **November 30, 2022**

Website for the invited track information: <http://m.rakoton.net/ITifacWC23mechatronics.php>