Open Invited Track on:

"Smart materials based mechatronic systems and structures: control aspects"

Organizer:
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Track abstract:
Smart materials are materials that exhibit inherent properties change when subjected to external stimuli. When the property change yields deformation, displacement or force and stress, one can develop actuators. This open invited track is interested in mechatronic systems and structures that use smart materials based actuators, including but not limited to: piezoelectric, shape memory alloy, magnetic shape memory alloy, electroactive polymers, magnetoactive polymers, magnetostrictive, magnetic fluid, or electrical fluid actuators. One of the main advantages from those mechatronic systems and structures is the high resolution of positioning – sometimes down to nanometers, allowing them to be used in applications that require high precision. In counterpart, they exhibit strong nonlinearities due to the complex behaviors of the smart materials actuators. Moreover, certain systems and structures can exhibit unwanted or complex dynamics such as badly damped vibration. Also, the functioning principles of certain mechatronic systems are non-standard so that their modeling and control are very specific: stick-slip, inch-worm, dual-stage, hybrid actuation, … Finally, in some of their applications, the lack of appropriate sensors is a major problem that prevents from feedback control. As a summary, smart materials based mechatronic systems and structures raise several challenges when it comes to control aspects.

We propose in this open invited track the opportunity to bring together recent works on control aspects related to smart materials based mechatronic systems and structures. The expected papers include: modeling, signal estimation, identification and control.

Technical Committee: *This invited track is supported by the IFAC T.C.4.2-Mechatronic Systems.*

Keywords: modeling, identification, signal estimation, advanced methodologies of control, smart materials based actuators – systems – structures.

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

Invited track submission code: ***6v3j8***

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/ITifacWC23SmartMechatronicsStrctures.php