Open invited track

22st IFAC World Congress, Yokohama, Japan, July 9 − 14, 2023

Control and estimation of dynamic systems on time scale: Methods and Applications

Code for submitting contributions: thqm5

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Abstract:

This open invited track is proposed for inclusion in the IFAC world congress 2023 to be held in Yokohama in Japan, July 9-14, 2023. This open invited track invites contributions on analysis, control and estimation design for dynamic systems on time scales, aims at presenting recent advances in this field and gives a forum to discuss tentative future directions.

Keywords: Time scale; stability analysis, controllability, observability, control design, observer design

Description:

Continuous and discrete mathematical models are commonly used to describe physical systems. However, various systems exhibit hybrid structures where both continuous and discrete events co-exist. The presence of discrete events can be attributed, for instance, to existing switches in the systems or in some interruptions. The current continuous or discrete theory does not consider the two dynamics at the same time. Therefore, a more general theory that unifies the continuous and discrete models provides an opportunity to better describe and control dynamic systems. Time scale dynamic representation provides a unified framework for systems with both continuous and discrete dynamics. They allow the consideration of systems evolving on various time domains including uniform and nonuniform domains.

The mathematical analysis of dynamical systems is an active research area where the standard control concepts have been extended to dynamic systems evolving on arbitrary time scales. There are still many open questions in the field. The objective of this open invited track is to present the recent advances and to discuss the current challenges in analysis, control design, and observer design of dynamical systems on a time scale. Both theoretical and application-oriented contributions are welcome.

The topics covered in this session lie in the **"Systems and Signals: TC1.3 Discrete Event Systems and Hybrid Systems"** research areas, and we look forward to receiving contributions to this track.