IFAC World Congress 2020 special track on Nonlinear System Identification Benchmarks

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Abstract: The objective of this invited track is to present novel data-driven modeling approaches for nonlinear systems. Solicited contributions should illustrate the developed methods and techniques on one or more nonlinear system datasets that are available on the nonlinearbenchmark.org platform. This open invited track aims, by promoting interaction through the benchmark setups, to develop a better understanding of and insight in state-of-the-art data-driven modeling approaches. Ten different datasets are available ranging from well-established benchmark challenges in the nonlinear system identification community (e.g. the Silverbox and the Wiener-Hammerstein datasets) to recent challenging datasets of real life systems (e.g. the F-16 Ground Vibration Test and the Cortical Response Evoked by Wrist Joint Manipulation datasets).

IFAC Technical Committee for evaluation: TC1.1

Detailed Description: This open invited track is structured around the ten nonlinear system datasets featured on the nonlinearbenchmark.org platform. These datasets feature state-of-the-art challenges in nonlinear system identification, such as dynamical nonlinearity, process noise, high system complexity and short data records. The nonlinearbenchmark.org website functions as a platform providing detailed information regarding the datasets, and making available numerical and experimental datasets together with identification and validation guidelines. The invited track follows the success of the Workshop on Nonlinear System Identification Benchmarks which has been organized yearly over the last 4 years. Solicited contributions should describe solutions to one or more of these benchmark problems.

The objective of this invited track is to advance the current knowledge in nonlinear system identification by encouraging the exchange of ideas between the systems and control, mechanical, machine learning communities and any other research community working on the data-driven modeling of nonlinear systems. These communities have developed over the years various and numerous nonlinear modeling approaches driven by different backgrounds, constraints and end-uses. Moreover, they generally focus on different aspects of the modeling problem as they face different limiting factors in terms of model quality and identification cost. This is why we believe that, by promoting interaction through the benchmark setups, significant benefit can be mutually gained.

Invited session identification code: 27qyg

Website: http://www.nonlinearbenchmark.org/