

Online Seminar Series for IFAC TC 1.2 Adaptive & Learning Systems

Organizers: **Tiago Roux Oliveira**, State University of Rio de Janeiro – UERJ, TC 1.2 Chair
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Details of the Seminar

Title: Data privacy in multi-agent optimization under uncertainty

Speaker: Prof. **Maria Prandini**, Politecnico di Milano

Time: **February 12, 2026 (04:00pm CET)**



Abstract: We consider multi-agent optimization problems over networks, where agents cooperate to reach agreement on a common decision or on the share of a common resource. We investigate the setting where the environment within which agents operate is uncertain, each agent has access to a finite amount of data on the uncertain phenomenon, and these data constitute a private resource that is not to be exchanged or shared among agents. We provide a data driven framework to address these problems, and show how to accompany decisions in such a private-data regime with probabilistic certificates of robustness using tools from the so called scenario approach. Moreover, we discuss how such decisions can be computed in a distributed manner. To this end, we presented a general distributed architecture as a multi-agent information exchange mechanism, and illustrated it by outlining specific algorithms to solve decision and constraint couple optimization problems. This is a joint work with Kostas Margellos (University of Oxford, UK), Alessandro Falsone and Simone Garatti (Politecnico di Milano, Italy).

Bio: Maria Prandini is currently full professor in Automatic Control at Politecnico di Milano, Italy. She has been contributing to the activities of the IEEE Control Systems Society (CSS), the International Federation of Automatic Control (IFAC), and the Association for Computing Machinery (ACM) in different roles. She is currently IFAC President-elect. Previously, she was Vice-President for conference activities for IFAC (2020-23) and IEEE CSS (2016 and 2017), and a member of SIGBED Board of Directors (2019-21). She was elected Fellow of the IEEE in 2020 and received the IEEE CSS Distinguished Member award in 2018. In 2017, she was August-Wilhelm Scheer Visiting Professor and Honorary fellow of the TUM Institute for Advanced Studied. She was conferred the title of Visiting Professor in Engineering at the University of Oxford for the triennia 2022-2025 and 2025-2028. Her research interests include stochastic hybrid systems, distributed and data-driven optimization, federated learning in multi-agent systems, and the application of control theory to transportation and energy systems.

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