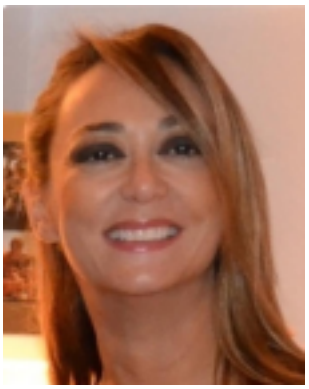
TIME DELAY SYSTEMS

Webinar TDS

2025

Control of Multi-Agent Systems with time delays: theory and applications



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Sept. 5, 2025, Friday @ 4:00 pm (CET)

7:00 am (PDT), 10:00 am (EDT), 10:00 pm (CST)

Event will take place via Zoom

ABSTRACT: During the last years, the rapid development of communication technologies has brought considerable attention to the control of Multi-Agent Systems (MASs) and Networked Control Systems (NCS), due to their broad applications in a wide range of real-world engineering applications, such the cooperative driving of autonomous connected vehicles and the distributed smart grid control, among the others. In cooperative control of multi-agent systems, one of the important problems is to design an appropriate distributed control protocol which, operating on local information and the ones exchanged among neighboring agents via communication networks, let the group to reach a consensus or agreement on certain quantities of interest, hence performing tasks that they could not alone by themselves. However, the insertion of a shared communication network in feedback control loops makes the analysis and the design of distributed controllers more sophisticated and can lead to the onset of several issues to face. These latter are denoted as communication constraints induced by the communication network and may involve network-induced delays, data packet dropouts, quantization errors, time-varying network topologies and network channel fading. In this perspective, this talk aims at exploring how to design novel cooperative control solutions able to face communication constraints challenges in a resilient and robust way.

BIO: Stefania Santini is Professor of Systems and Control Engineering (Automatica) at University of Naples Federico II (Italy), where she has been a Member of the Academic Senate from 2013 to 2021. She leads the Distributed Automation Systems Lab, a research group in the field of distributed automation and its applications. Her research interests include nonlinear control of nonlinear and cyber-physical systems, time-delayed systems, networked control and multi-agent systems, with applications to automotive engineering, transportation technologies, and more recently to the application domains of smart manufacturing, information technology and energy. She is senior Editor of IEEE Transactions on Intelligent Transportation Systems (IEE T-ITS) and Associate Editor of IEEE Transactions on Control Systems Technology (IEEE T-CST) and IEEE Transaction on Aerospace and Electronic Systems (IEEE T-AES). She is also Vice-Chair IEEE ITS Italian Chapter. She was and is principal investigator of many national and international research projects, also in cooperation with industry, including small- and medium-sized enterprises.

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