

TIME DELAY SYSTEMS

Webinar

TDS

2021

Delays, dynamics and singularity tracking. A guided tour



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Sept. 10, 2021, Friday @ 4:00 pm (CET)

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

Event will take place via Zoom

ABSTRACT: This joint work with Islam BOUSSAADA (France), Xu-Guang LI (China), Guilherme MAZANTI (France), and Fernando MENDEZ-BARRIOS (Mexico) covers some of the research topics the speaker was interested over the last decade. More precisely, we are proposing a guided tour of some specific problems encountered in the (stability) analysis and control of linear dynamical systems including delays in their systems' representation. Our focus will be on the characterization of some of the system's dynamics singularities. The presentation covers several approaches (perturbation techniques, hypergeometric functions) leading to some methods and criteria (frequency-sweeping, multiplicity-induced-dominancy) that can be implemented (software toolboxes) for analyzing the qualitative and quantitative properties induced by the delays and other parameters on the system's dynamics. A particular attention will be paid to the so-called "partial pole placement" method based on the multiplicity-induced dominancy. The presentation is intended to be as simple as possible, focusing on the main intuitive ideas and related mathematical reasoning by analogy to present theoretical results as well as their potential use in practical applications.

BIO: Silviu-Iulian Niculescu received the B.S. degree from the Polytechnical Institute of Bucharest, Romania, the M.Sc., and Ph.D. degrees from the Institut National Polytechnique de Grenoble, France, and the French Habilitation (HDR) from Université de Technologie de Compiègne, all in Automatic Control, in 1992, 1993, 1996, and 2003, respectively. He is currently Research Director at CNRS (French National Center for Scientific Research), L2S (Laboratory of Signals and Systems), a joint research unit of CNRS with CentraleSupélec and Université Paris-Saclay located at Gif-sur-Yvette. Dr. Niculescu is a founding member of the Inria team "DISCO" and he was the head of L2S for a decade (2010-2019). He is author/coauthor of 11 books and of more than 575 scientific papers. His research interests include delay systems, robust control, operator theory, and numerical methods in optimization, and their applications to the design of engineering systems. Since 2017, he is the Chair of the IFAC TC "Linear Control Systems" and he served as Associate Editor for several journals in Control area, including the IEEE Transactions on Automatic Control (2003-2005). IEEE Fellow since 2018, Doctor Honoris Causa of University of Craiova (Romania) since 2016, Founding Editor and Editor-in-Chief of the Springer Nature Series "Advances in delays and dynamics" since its creation in 2012, Dr. Niculescu was awarded the CNRS Silver and Bronze Medals for scientific research and the Ph.D. Thesis Award from Grenoble INP (France) in 2011, 2001 and 1996, respectively. For further information, please visit: <https://cv.archives-ouvertes.fr/silviu-iulian-niculescu>



Questions? Contact: Gabor Orosz, orosz@umich.edu