

TIME DELAY SYSTEMS

Webinar

TDS

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Parameter Sensitivity in Time Delay Systems



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March 26, 2021, Friday @ 4:00 pm (CET)

8:00 am (PDT), 11:00 am (EDT), 11:00 pm (CST)

Event will take place via Zoom

ABSTRACT: It is a rule of thumb that increasing time delay has destabilizing effects in dynamical systems: it tends to make equilibria unstable, bifurcations subcritical, and chaos often appears in the jungle of the emerging unstable limit cycles. The lecture will discuss cases when the stability properties show extreme sensitivity to system parameters, especially to the time delays. These cases may seem to be mathematical curiosities, but they originate in relevant physical examples like the acceleration feedback in the wheeled inverted pendulum, the squealing sound in public address systems, or the hardware-in-the-loop tests of high-speed cutting.

BIO: Gábor Stépán is a professor in Applied Mechanics at Budapest University of Technology and Economics (BME), Hungary. He served on the editorial boards of *Nonlinear Dynamics*, *Mechanism and Machine Theory*, *Physica D*, *Philosophical Transactions of the Royal Society*. He is a member of the Hungarian Academy of Sciences and the Academy of Europe. He is an ERC Advanced Grant and Proof of Concept Grant holder, the recipient of the Thomas K. Caughey Dynamics Award of ASME. He also served as the dean of the Faculty of Mechanical Engineering at BME. He is an elected member of the Executive Committee of the Congress Committee of IUTAM, and the EuroMech Council. His research interests include nonlinear vibrations and time delay systems with specific applications in mechanical engineering, like rehabilitation robotics, machine tool vibrations, wheel shimmy, hardware-in-the-loop experiments.



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