SEMINAR SERIES

北京大学工学院 航空航天工程系

From nonlinear time delay systems to the safety of connected automated vehicles

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Abstract: In this talk I will focus on stability and safety in nonlinear systems subject to time delay. I will show that stable equilibria may coexist with stable and unstable limit cycle oscillations and will present constructive methods to calculate the periodic motion. I will also relate these findings to safety in dynamical systems. As a primary application I will demonstrate the findings on the control design of connected automated vehicles. The theoretical results are also implemented on full size automobiles and trucks where having formal guarantees of safety is of utmost importance.

Biography of speaker : Gabor Orosz received the MSc degree in Engineering Physics from the Budapest University of Technology, Hungary, in 2002 and the PhD degree in Engineering Mathematics from the University of Bristol, UK, in 2006. He held postdoctoral positions at the University of Exeter, UK, and at the University of California, Santa Barbara. In 2010, he joined the University of Michigan, Ann Arbor where he is currently a Professor in Mechanical Engineering and in Civil and Environmental Engineering. From 2017 to 2018 he was a Visiting Professor in Control and Dynamical Systems at the California Institute of Technology. In 2022 he was a Distinguished Guest Researcher in Applied Mechanics at the Budapest University of Technology and from 2023 to 2024 he was a Fulbright Scholar at the same institution. His research interests include nonlinear dynamics and control, time delay systems, machine learning, and data-driven systems with applications to connected and automated vehicles, traffic flow, and biological networks.

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