ACC Webinar Series

We are proud to announce our 5th webinar in the ACC Webinar Series:

"Nonlinear Adaptive Cruise Control for Vehicular Platoons"

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Friday, Oct 29th, 2021 --- 11:00 AM (EDT)
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ABSTRACT
Vehicle automation has made tremendous advances in the last decades, and the path to full automation of vehicles in a foreseeable future seems more than likely. An initial stage of vehicle automation is the standard cruise control system which maintains the speed of the vehicle at a desired value to assist the driver. These systems have meanwhile evolved to Adaptive Cruise Control (ACC) systems, which automatically adjust the speed to maintain certain distance from a front vehicle or to maintain a desired speed. In this webinar, I will present a class of novel nonlinear adaptive cruise controllers for platoons of autonomous vehicles operating on an open road or a ring-road. The proposed feedback controllers are nonlinear functions of the distance between successive vehicles and their speeds and guarantee safety (collision avoidance), speed positivity, bounded acceleration, speed limits by explicitly characterizing the set of allowable inputs. Moreover, I will present conditions that guarantee global asymptotic stability of the platoon to the desired configuration, as well as string stability. Certain macroscopic properties will also be discussed. The efficiency of the nonlinear adaptive cruise controllers will be demonstrated by means of numerical examples.

BIOGRAPHY
Dionysis Theodosis received the B.S. degree in mathematics from the University of Aegean, Greece, and the M.Sc. degree in applied mathematical sciences and the Ph.D. degree in applied mathematics from the National Technical University of Athens, Athens, Greece, in 2009, 2011, and 2017, respectively. From April 2017 and December 2019, he has been a Post-doctoral Researcher at the Division of Decision and Control Systems, School of Electrical Engineering, Royal Institute of Technology (KTH), Stockholm, Sweden. He is currently a Postdoctoral Researcher with the Dynamic Systems and Simulation Laboratory, Technical University of Crete.