Towards Intelligent Transportation in Smart Cities: Flocking Control of Connected and Automated Vehicles

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12:00 to 1:15 PM US Arizona
https://asu.zoom.us/j/640985603

About the Speaker

Dr. Yan Chen is currently an Assistant Professor at Arizona State University and founded Dynamic Systems and Control Laboratory (DSCL) in 2016. Dr. Chen has three years of full-time automotive industrial research experience, after he got the Ph.D. degree in Mechanical Engineering from The Ohio State University, Columbus in 2013. Dr. Chen's research interests include design, modeling, estimation, control, and optimization of dynamic systems, specifically for connected and automated vehicles and (hybrid) electric vehicles. He is the author or co-author of more than 50 peer-reviewed publications.

Dr. Chen serves as an Associate Editor for the journal of IFAC Mechatronics, the ASME Dynamic Systems and Control Conference (DSCC), and American Control Conference. He currently serves as the secretary of ASME Automotive and Transportation Systems Technical Committee. Dr. Chen is a recipient of 2020 SAE Ralph R. Teetor Educational Award and 2019 DSCC Automotive and Transportation Systems Best Paper Award.

About the Talk

Connected and automated vehicles (CAVs) are considered as one enabling technology for intelligent transportation and smart cities. In this talk, I will first overview and summarize the research work about CAVs in the DSCL, with emphases on single AV, multiple CAVs, and hardware development and demonstrations. I will then discuss a specific research topic about flocking control of multiple CAVs, given that a single AV driving is largely tested and validated on roads worldwide. For the specific topic, the challenges and issues of control of multiple CAVs will be first reviewed, especially on vehicle dynamics control. To overcome the challenges and realize the flocking control of multiple CAVs, a novel hierarchical framework is proposed to integrate high-level flocking control with low-level vehicle dynamics control. Finally, experimental results of multiple scaled CAVs will be shown to demonstrate the effectiveness of the proposed method, compared with the existing flocking control design.

This seminar has been converted to a webinar and is now webcast live to a worldwide audience using Zoom.

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