Committee on Traffic Flow Theory and Characteristics
(TRB ACP50)

ACC Webinar Series

We are proud to announce our 3rd webinar in the ACC Webinar Series:

"Data-driven String Stability Analysis for Commercial Automated Vehicles Car Following Control Algorithm"

Dr. Yang Zhou, PhD
Postdoctoral Research Associate
Civil and Environmental Engineering

Thursday, Aug 26th, 2021 --- 11:00 AM (EDT)
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ABSTRACT
This presentation provides a data-driven stability analysis method which can be applied to complex or unknown controllers, for which a traditional theoretical string stability analysis is not feasible. Specifically, a Welch's method and a wavelet method are developed to extract the empirical frequency response function from vehicle trajectories. Based on that, string stability analysis are conducted to evaluate string stability of car-following control in a data-driven fashion. The methods are applied to field data of partially automated vehicles with adaptive cruise control (ACC) function on the market. Findings reveal that all tested vehicles are string unstable, particularly for low frequency disturbances (< 0.5 Hz).

BIOGRAPHY

Yang Zhou, received the Ph.D. degree and M.S. degree in Civil and Environmental Engineering from University of Wisconsin Madison, WI, USA, in 2019 and University of Illinois at Urbana-Champaign, Champaign, IL, USA, in 2015. He is currently a postdoctoral researcher in civil engineering, University of Wisconsin Madison, WI, USA. His main research directions are connected automated vehicles robust control, interconnected system stability analysis, traffic big data analysis, and microscopic traffic flow modeling