

Stochastic Modeling of Traffic Breakdown for Freeway Merge Bottlenecks

Thursday, April 5, 2018

12:00 - 1:00 pm

[College Avenue Commons \(CAVC\) Room 455](#) [\(Parking\)](#)



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About the Talk

This talk will present a novel breakdown probability model based on microscopic driver behavior for a freeway merge bottleneck. Extending Newell's car following model to describe the transition from free-flow to congested regimes, two elements of breakdown, trigger and propagation, are derived in terms of vehicle headway. Combining these elements, a general breakdown probability is derived in terms of various parameters related to driver behavior and traffic conditions – other than flow – that can be treated as constants or stochastic with probability distributions. The proposed model is validated with real data. Based on the model properties, a proactive traffic control method is developed considering low penetration rates of connected automated vehicle technologies.

About the Speaker

Dr. Soyoung Ahn is an Associate Professor in the Department of Civil and Environmental Engineering at the University of Wisconsin - Madison. Prior to joining the University of Wisconsin-Madison in 2013, she served on the faculty of the School of Sustainable Engineering and the Built Environment at Arizona State University (ASU) for 7 years. She received her PhD in Civil and Environmental Engineering from the University of California, Berkeley in 2005. She is an expert in traffic flow analysis and modeling, (numerical) simulations, and traffic control using emerging technologies. Her recent research involves (i) evaluation of performance of connected autonomous vehicles (CAVs), particularly cooperative adaptive cruise control (CACC) vehicles, (ii) development of CACC platoon control strategies, and (iii) development of system control strategies using CAVs. She is Chair of the Transportation Research Board (TRB) Traffic Flow Theory and Characteristics Committee, an Associate Editor for Transportation Research Part C, and an editorial board member for Transportation Research Part B.

Refreshments provided by Graduate & Professional Student Association (GPSA). Event is open to the public.



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