school of computing, informatics, & decision systems engineering

IE Decision Systems Engineering Fall '20 Seminar Series

Friday, October 23 | 3:00-4:00PM |ZOOM https://asu.zoom.us/j/81413425044

"Framework for Loss Distribution of the Operational Risk of Vehicle-to-Vehicle Cooperation to Marshal Traffic via Monetization of Highway Space"

Petar Jevtić

Assistant Professor at the School of Mathematical and Statistical Sciences, Arizona State University

Biography

Petar Jevtić is an Assistant Professor at the School of Mathematical and Statistical Sciences, Arizona State University, USA. He previously held an Assistant Professor position at the Department of Mathematics and Statistics, McMaster University, Canada, where he also completed his Postdoctoral Fellowship. He received a Ph.D. degree in Economics, with a specialization in Mathematics and Statistics, from the School of Management and Economics, University of Turin, Italy. During this Ph.D., he was a visiting scholar at the Wharton School, University of Pennsylvania, and Temple University, USA. He holds a M.Sc. degree in Economics from Faculty of Economics, University of Belgrade, Serbia, and Dipl. Ing. degree in Computer Science and Engineering from the School of Electrical Engineering, University of Belgrade, Serbia. His research focus is on the mathematical modeling of risk with primary applications in Actuarial Science and Math. Finance.

Abstract

In this work, we develop a framework for loss distribution of the operational risk of vehicle-to-vehicle cooperation to marshal traffic via monetization of highway space. As a motivating technological solution, we consider the Cooperatively Managed Merge and Pass (CMMP) system proposed by Ford Motor Company. In the USA alone, traffic congestion in terms of time lost imposes substantial opportunity costs, afflicts commuters with stress, and contributes to air pollution. Acting in concert, a vehicle-to-vehicle In this work, we develop a framework for loss distribution of the operational risk of vehicle-to-vehicle cooperation to marshal traffic via monetization of highway space. As a motivating technological solution, we consider the Cooperatively Managed Merge and Pass (CMMP) system proposed by Ford Motor Company. In the USA alone, traffic congestion in terms of time lost imposes substantial opportunity costs, afflicts commuters with stress, and contributes to air pollution. Acting in concert, a vehicle-to-vehicle communications infrastructure, blockchain, smart contracts, and digital assets technologies allow for novel solutions to this long-standing problem. So far, leading automobile manufacturers have offered several technological solutions for real-time monetization of highway space. Unfortunately, often the technology stack required has cyber vulnerabilities leaving these solutions open to misuse. In that context, understanding the operational risk via its loss distribution is of high importance for operators and insurers. That is why we pioneer the approach that contextualizes the problem in the probabilistic graph theoretical framework by using percolation models. In the case of adverse materialization of cyber risk and its spread through a vehicular network, we allow for spatially heterogeneous loss topology. In the context of the USA, we provide instructive numerical examples. communications infrastructure, blockchain, smart contracts, and digital assets technologies allow for novel solutions to this long-standing problem. So far, leading automobile manufacturers have offered several technological solutions for real-time monetization of highway space. Unfortunately, often the technology stack required has cyber vulnerabilities leaving these solutions open to misuse. In that context, understanding the operational risk via its loss distribution is of high importance for operators and insurers. That is why we pioneer the approach that contextualizes the problem in the probabilistic graph theoretical framework by using percolation models. In the case of adverse materialization of cyber risk and its spread through a vehicular network, we allow for spatially heterogeneous loss topology. In the context of the USA, we provide instructive numerical examples.

Ira A. Fulton Schools of Engineering
Arizona State University

Hosted by: Giulia Pedrielli