

TEMPLE UNIVERSITY
Department of Mathematics

Applied Mathematics and Scientific Computing Seminar

Room 617 Wachman Hall

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SAFE2RIDE (Sustainable And Fair Ecosystem Towards Robotic–Human Vehicle Interactive Driving Equilibrium)

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Abstract. As this era’s biggest game-changer, autonomous vehicles (AV) are expected to exhibit new driving and travel behaviors, thanks to their sensing, communication, and computational capabilities. However, a majority of studies simply tailor human-driven vehicles (HV)’s behavior for AVs by tweaking some behavioral parameters. In these models, AVs are essentially human drivers but react faster, “see” farther, and “know” the road environment better. We believe AVs’ most disruptive characteristic lies in its intelligent goal-seeking behavior. Accordingly, in this talk, I will first introduce a game-theoretic framework we have developed to model autonomous driving behavior. To illustrate the potential advantages that AVs may bring to stabilize traffic, we propose a multi-class game where AVs are modeled as intelligent game-players and HVs are modeled using a classical non-equilibrium traffic flow model. Numerical results are provided to illustrate that a certain portion of AVs can stabilize traffic.