MIT
MATHEMATICS

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
DEPARTMENT OF MATHEMATICS

Applied Math Colloquium

Monday, November 25, 2019

4:15pm   Room : 2 - 190

Benjamin Seibold
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"Understanding How Vehicle Automation Changes Traffic Flow Patterns"

Abstract

A distinguishing feature of vehicular traffic flow is that it may exhibit significant non-equilibrium behavior: in congested flow, stop-and-go waves arise that waste fuel and increase emissions and accident risk. We present mathematical models that provide a phenomenological understanding of the causes and dynamics of traffic waves. We then project the future, in which connected and automated vehicles (CAVs) will be immersed in the traffic stream. We show, via models, simulations, and experiments that automation can go both ways: a small number of CAVs can control traffic flow to remove traffic waves; but conversely, semi-automation can generate concerning flow patterns that are much worse than what human drivers generate.

Reception preceding the talk in room: 2-290 at 3:45pm