POLITECNICO DI TORINO

DISMA Dipartimento di Scienze Matematiche G. L. Lagrange

ECCELLENZA 2018 • 2022

Thursday October 3, 2019 at 14:30
Politecnico di Torino, DISMA, Aula Buzano (third floor)

Gustav NILSSON

Postdoctoral Associate at GeorgiaTech

On Robustness of Equilibria in Dynamical Transportation Networks

Prof. Giacomo Como introduces the seminar.

Abstract

With growing traffic demands, transportation networks become more and more congested and prone to disruptions. This talk will address how different perturbations affect the free flow equilibria, i.e., equilibria where no congestion effects are present, in transportation networks. Since keeping the transportation network in the free-flow region is highly desirable, it is crucial to know how robust those equilibria are. A generalized cell transmission model is used to model the dynamics of the transportation network. The perturbations that can either be caused by an accident or an attack are perturbations in the exogenous inflows, flow capacity drops, and disruptions in the routing, i.e., when drivers deviate from their usual route preferences. Through some examples, the talk will show how the optimal equilibrium from a classical traffic assignment perspective, may not be the most robust one.

Biography

Gustav Nilsson received his M.Sc. in Engineering Physics and Ph.D. in Automatic Control from Lund University in 2013 and 2019, respectively. He is currently a Postdoctoral Associate at GeorgiaTech, GA, USA. During his Ph.D. studies, he has been a visiting researcher at the Institute of Pure and Applied Mathematics (IPAM), UCLA, CA, USA and at Department of Mathematical Sciences, Politecnico di Torino, Turin, Italy. Between October 2017 and March 2018, he did an internship at Mitsubishi Electric Research Laboratories in Cambridge, MA, USA. His primary research interest lies in modeling and control of dynamical flow networks with applications in transportation networks.