



Traffic Flow Control via PDE Techniques

Full-day Workshop within the 57th IEEE Conference on Decision and Control, Miami Beach, FL, USA, December 17—19, 2018.

Organizers: Nikolaos Bekiaris-Liberis, Maria Laura Delle Monache, Delphine Bresch-Pietri, Rafael Vazquez.

Workshop overview

The main goal of the workshop is to review some of the most up-to-date advances in the field of (vehicular) traffic flow control using tools coming from control of Partial Differential Equations (PDEs). The workshop covers both theoretical and practical aspects of this topic, bridging the gap between theory and practice of PDE-based traffic flow control techniques. The workshop includes both classical traffic flow control approaches as well as future traffic management techniques. The workshop incorporates presentations from a diverse group of researchers, with respect to their approaches & expertise, background & training, geographical location, and gender.

Expected outcomes

The attendees will acquire new knowledge of both methodologies for control and estimation of distributed parameter systems as well as for traffic flow control. After the end of the workshop, the audience will be aware of the challenges and open problems of PDE-based traffic flow control both from the methodological and practical viewpoints. The workshop would be useful in establishing new connections among the participants, thus paving the way for the future advancements in the field.

Target audience

The target audience consists of researchers from academia (at various seniority levels from graduate students to full professors) as well as control practitioners from industry, including, control theorists, mathematicians, and engineers. There are no particular prerequisites for attendees and the workshop is self-contained, but some basic knowledge of linear/nonlinear systems and control theory would be useful.

Speakers

- **Miroslav Krstic**, University of California, San Diego, USA. **Talk:** *Calming “stop-and-go” in congested traffic.*
- **Christophe Prieur**, CNRS, France. **Talk:** *Recent advances on Lyapunov-based control for traffic flow.*
- **Iasson Karafyllis**, National Technical University of Athens, Greece. **Talk:** *Feedback control of scalar conservation laws with application to density control in freeways by means of variable speed limits.*
- **Christian Claudel**, University of Texas at Austin, USA. **Talk:** *A fast semi-analytic algorithm for computing solutions associated with multiple fixed or mobile capacity restrictions: applications to bus holding control.*
- **Maria Laura Delle Monache**, Inria, France. **Talk:** *Can big data help traffic flow control?.*
- **Benedetto Piccoli**, Rutgers University, USA. **Talk:** *Lagrangian controls for traffic flow with autonomous and connected vehicles.*
- **Paola Goatin**, Inria, France. **Talk:** *Macroscopic modeling of traffic control by autonomous vehicles.*
- **Gabor Orosz**, University of Michigan, Ann Arbor, USA. **Talk:** *Mitigating traffic waves with connected automated vehicle.*
- **Nikolaos Bekiaris-Liberis**, Technical University of Crete, Greece. **Talk:** *Traffic flow control via PDEs: Delay-compensating and fault-tolerant designs.*

Logistics

Date, Time, & Location: Sunday, December 16, 2018, 8:30 am — 5:15 pm, Room: Splash 10 (Fontainebleau Hotel).

Registration: 170 USD (select WP08 when registering for CDC).

Preferred deadline for registration: September 20, 2018 (with final papers submission, to avoid last minute workshop cancellation).