

MAGDEBURG LECTURES ON OPTIMIZATION AND CONTROL

MathCoRe Lecture



MAGdeburg Lectures on Optimization and Control
Systems and Control Seminar

Paolo Falcone
Department of Electrical Engineering
Chalmers University of Technology
Gothenburg, Sweden

Coordination of Autonomous Vehicles at Traffic Junctions. Theory and Experiments

Tue, 14.05.2019 17:00-18:00 G30-460

Further information:
www.control.orgu.de
www.math.uni-magdeburg.de

Contact:
raff.falcoen@orgu.de

Jointly organized by: Faculty of Electrical Engineering and Information Technology
Faculty of Mathematics
Max Planck Institute Magdeburg
Center for Dynamic Systems, Biomechanics Engineering

08.11.2018 - **Coordination of Autonomous Vehicles at Traffic Junctions. Theory and Experiments**

› Prof. Paolo Falcone

(<https://www.chalmers.se/en/Staff/Pages/paolo-falcone.aspx>) Department of Electrical Engineering
Chalmers University of Technology
Gothenburg, Sweden

Time & Place

The presentation on May 14, 2019 will be given in building 10, room 460 at the › Otto-von-Guericke-University of Magdeburg (<https://www.uni-magdeburg.de/>) and starts at 5.00 p.m..

Abstract

The next challenge, beyond high-level autonomous driving, is the coordination of autonomous vehicles, which is expected to fully enable the potential of autonomous driving technologies and heavily impact the society. Nevertheless, the safety and performance issues arising from the tight coupling between

information losses and delays and the control system stability and performance must be accounted for at the design stage. Starting from a multi-vehicle coordination problem at traffic junctions, which has been experimentally demonstrated relying on both the IEEE 802.11p wireless standard and a 5G cellular network prototype, we will motivate a joint communication and control paradigm, where a central coordinator decides upon control inputs to a set of dynamical systems and their access to the communication channel. We will show a few results from numerical examples and new research directions.

Short CV

Paolo Falcone is Associate Professor in the Mechatronics research group. His research focuses on constrained optimal control and verification methods, applied to autonomous and semi-autonomous mobile systems, cooperative driving and intelligent vehicles. He is involved in a range of projects, in cooperation with industry, focusing on autonomous driving, cooperative driving and vehicle dynamics control. His teaching subjects include Model predictive control, Vehicle dynamics control and Modeling and simulation of dynamical systems.