MORE on Automotive: Cyber-Physical-Systems
(Control, Robustness, Security)

CHAIRS and Organizers:
Prof. Laura Giarré (Università di Modena e Reggio Emilia)
Prof. Bruno Sinopoli (Carnegie Mellon University)

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SALA TECNOPOLO
DIEF- UNIMORE
Modena

The technological landscape in automotive systems is rapidly evolving thanks to several technological developments such as hybrid and electric powertrains and their relationship with the power grid, autonomous driving, vehicle-to-vehicle (v2v) and vehicle-to-infrastructure (v2i) communication. The domain of Cyber-physical Systems, referred loosely to the integration of widespread sensing, communication, computing and control in the physical world, aims at addressing the numerous challenges this new paradigm presents. In particular, in the automotive realm, innovations introduce a number of challenges both at the vehicle level and in the interaction with transportation infrastructure. In addition, robustness and security issues need to be taken into account at the system rather than at the component level. Security needs to be integrated in the design rather than being introduced as an afterthought. The University of Modena and Reggio Emilia is strategically placed at the juncture of one of the most innovative automotive parks in the world and is poised to address such issues both at the research and educational level in collaboration with the surrounding automotive ecosystem.

The proposed one-day workshop is meant to be a forum where academia and industry meet to discuss forward-looking themes and find new opportunities of collaboration.
PROGRAM

Chair Prof. Laura Giarré (UniMORE)

9.30 Prof. Angelo Andrisano, Rector of the Università di Modena e Reggio Emilia Welcome Address
9.40 KEYNOTE: Ing. Claudio Silenzi (Ferrari Motorsport) Challenges in Automotive: From Racing To Vehicle Production

10.10 TRACK 1 Automotive
Chair Dr. Davide Barater (UniMORE)
Prof. Alberto Bemporad (IMTL Lucca) Model Predictive Control for Automotive Production
Prof. Mara Tanelli (Politecnico di Milano) Classification and learning for advanced driving-style assessment
Dr. Andrea Balluchi (Pure Power Control) Formal verification in functional safety analysis of hybrid electric powertrains

11:10 Break

11.40 TRACK 2 Transportation and Control
Chair Dr. Luigi Biagiotti (UniMORE)
Ing. Roberto Bez (LFoundry) Smart technologies for automotive
Prof. Antonella Ferrara (Università di Pavia) From single vehicle control to platoons of automated vehicles and their impact on traffic
Prof. Roberto Zanasi (UniMORE) POG Modeling of Automotive Systems

14.30-15.00 Academia towards Industry
Prof. Paolo Pavan (UniMORE) Presents the ACADEMY and the MUNER experience
Prof. Tiziano Bursi, Prof. Luigi Rovati (UniMORE) Presents TACC initiative for STARTUPs in automotive

15.00 TRACK 3 Cyber Physical Systems
Chair: Prof. Maria Luisa Merani (UniMORE)
Prof. Luca Schenato (Università di Padova) Automatic control over Wi-Fi: a cross-layer approach
Prof. Maria Prandini (Politecnico di Milano) A set-based approach to robust control and verification of piecewise affine systems subject to safety specifications

16:00 Break

16.30 ROUNDTABLE: OPPORTUNITIES OF INDUSTRIAL COLLABORATION
Moderator: Prof. Francesco Leali (UniMORE)