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Title: The intelligent powertrain: model-predictive control based on vehicle-to-X communication

Abstract

Modern vehicles are getting more and more connected and autonomous. Until today, the combustion engine control is mainly based on the actual boundaries and the current driver torque demand. A significant improvement of fuel efficiency and emissions can be achieved by connecting the domains of combustion control and vehicle-to-X (V2X) communication. This talk will show the potential of using novel sensors and information sources for predictive combustion control algorithms. It focusses on two sides of the control problem: firstly, the prediction of the upcoming vehicle speed trajectory depending on complex traffic scenarios is investigated. Secondly, different approaches to utilize the prediction for an improved operation of the combustion engine are presented. Validation is done by simulation, test bench and vehicle measurement.