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*A Hierarchical Ramp Metering Control System for Freeway Networks, pp.2257 – 2262*

Kotsialos, Apostolis  
Papageorgiou, Markos

Tech. Univ. of Crete  
Tech. Univ. of Crete

Abstract: A nonlinear model-predictive control approach to the problem of coordinated ramp metering is presented. The previously designed optimal control tool AMOC is used within the framework of a hierarchical control structure which consists of three control layers: the estimation/prediction layer, the optimization layer and the direct control layer. More emphasis is given to the last two layers where the control actions on a network-wide and on a local level, respectively, are decided. The hierarchical control strategy combines AMOC's coordinated ramp metering control with local feedback (ALINEA) control in an efficient way. Simulation investigations for the Amsterdam ring-road are reported whereby the results are compared with those obtained by applying ALINEA as a stand-alone strategy. It is demonstrated that the proposed control scheme is efficient, fair and real-time feasible.