

# Optimal Control and Parametric Sensitivity Analysis in Driver Assistance Systems

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**Abstract:** The talk discusses the usage of optimal control techniques in driver assistance systems in the automotive industry. In particular, approaches for collision avoidance with obstacles and pro-active active chassis control techniques taking into account comfort and handling issues will be presented.

The collision avoidance system in the first place aims at deciding whether a collision can be avoided or not. This is achieved by formulating appropriate optimal control problems. As a side product an avoidance trajectory is provided, if a collision can be avoided.

The pro-active chassis control can be realized by electro-rheological dampers, whose damping characteristics can be adapted in an optimal way to the street profile in front of the car. This requires real-time capable algorithms, which use model-predictive control and parametric sensitivities.

In both settings perturbations resulting from sensor measurement errors influence the problem setting. The dependence of optimal solutions with respect to such perturbations will be investigated by means of a parametric sensitivity analysis.

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