

# Energy efficient longitudinal vehicle control based on analysis of driving situations

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## Summary

The market penetration of vehicles equipped with state of the art electronic maps and environmental sensors is increasing steadily. Thus extended information on the road in front of the vehicle is available and can be used to enhance longitudinal control of vehicles. Future Adaptive Cruise Control (ACC) systems can be designed to reduce fuel consumption by applying energy efficient driving strategies in traffic situations. As these energy efficient driving strategies may affect driver acceptance negatively, a careful design of future driver assistance systems is required and needs to include customer acceptance tests.

This paper focuses on the methodology to optimize energy efficient driving strategies considering the driver behaviour of human subjects in specific traffic situations. The paper elaborates on basic considerations of vehicle dynamics to realize an energy efficient longitudinal control. An optimized driving strategy can be derived from simulations. A comparison between this strategy and average driving behaviour reveals impacts on the driver acceptance.