

Satellite-based system for predictive control in vehicles and its field of applications

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Abstract

A satellite-based system for predictive control enhances advanced driver assistance systems in the fields of comfort, safety and environment. The predictive information of the GNSS-receiver in combination with a next generation digital map are fused with local environment information of the vehicle's internal sensors and a distance sensor in the front of the vehicle. In comparison to conventional ADAS sensors, which can only take the distance of 200 m in front of the vehicle into account, ADAS with predictive sensor information can react to driving events such as velocity limitations, curve radii, intersections, road inclinations and traffic signs in an early stage and therefore help to increase the driving comfort and traffic safety and increase the traffic efficiency and reduce fuel consumption as well as CO₂ emissions. The development of the predictive preview system as well as the integration into test vehicles have been conducted at the ika (Institut für Kraftfahrwesen Aachen). Two different applications are presented as examples and the benefit of the satellite-based system is described in simulation and test results.