

Friction Estimation and Compensation for Steering Angle Control for Highly Automated Driving

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Abstract : This contribution presents a friction estimator for industrial purposes which identifies Coulomb friction in a steering system. The estimator only needs a few, usually known, steering system parameters. Friction occurs on almost every mechanical system and has a negative influence on high-precision position control. This is demonstrated on a steering angle controller for highly automated driving. In this steering system the friction induces limit cycles which cause oscillating vehicle movement when the vehicle follows a given reference trajectory. When compensating the friction with the introduced estimator, limit cycles can be suppressed. This is demonstrated by measurements in a series vehicle.

Keywords : friction estimation, friction compensation, steering system, lateral vehicle guidance

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