

基于逆系统方法的汽车方向盘转角识别Vehicle Steering Angle Identification Based on Inverse System Method

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关键词: 汽车 ■ 操纵动力学 ■ 方向盘转角 ■ 逆系统方法 ■ 仿真

摘 要: 将逆系统理论应用于汽车操纵动力学, 用于研究汽车精确达到给定侧向加速度时的驾驶员方向盘转角输入。以汽车方向盘转角输入的状态方程为基础, 在逆系统满足稳定、可逆、可控、可观的情况下, 分别以闭环仿真和实车试验得到的侧向加速度为逆系统输入识别方向盘转角, 并和实车试验的方向盘转角进行对比。结果表明: 该方法识别的方向盘转角和实车试验的方向盘转角运动趋势相似, 得到的侧向加速度与给定的侧向加速度绝对误差较小。  
The application of inverse system theory to vehicle handling dynamics was proposed to study steering angle input by driver for vehicle accurately achieving the given lateral acceleration. Based on the state equation of vehicle steering angle input, with the stable, invertible, controllable and observable inverse system meeting, steering angle was identified with the lateral acceleration of closed-loop simulation and actual test respectively as the inverse system input. Steering angle of identification was compared to that of actual test. The results showed that steering angle trend of identification conforms to that of actual test, with the small absolute error of lateral acceleration.

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