

基于理想转向传动比的汽车线控转向控制算法

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摘要 以29自由度汽车动力学模型为基础, 提出了保证汽车转向增益不变的理想传动比稳态控制策略, 使线控转向汽车转向特性不受车速和方向盘转角变化的影响; 提出了基于状态反馈的动态校正稳定性控制算法。仿真和驾驶模拟器实验表明, 基于理想转向传动比的稳态控制策略保证了汽车转向增益不变, 减轻了驾驶员的负担, 适合于更多的驾驶人; 基于状态反馈的动态校正稳定性控制算法有效提高了汽车的稳定性。

关键词 车辆工程 线控转向 转向传动比 稳态控制 稳定性控制

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Control algorithm for steer by wire system with ideal steering ratio

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Abstract Based on a 29DOF vehicle dynamic model, a steady state control strategy for the ideal steering ratio was introduced to keep the vehicle steering gain constant and make the steering characteristic of the steer by wire system not change with the vehicle speed and the steering angle; A stability control algorithm was proposed to correct the steering angle dynamically based on the vehicle state feedback. The results of the simulation and the test in a driving simulator showed that the introduced strategy does keep the vehicle steering gain constant to reduce the driver burden, allowing the unskilled driver to steer the vehicle. The proposed stability control algorithm based on the vehicle state feedback improves effectively the vehicle stability.

Key words vehicle engineering steering by wire steer ratio steady state control stability control

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