

(推荐) 拖拉机半挂车机组自动直线倒车控制器设计与实验

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关键词: 拖拉机 半挂车机组 自动直线倒车 最优控制

摘要: 应用最优控制理论对拖拉机半挂车机组自动直线倒车行驶进行了研究。应用最优控制理论和线性化的车辆运动方程设计了拖拉机半挂车机组直线倒车的线性二次型控制器,运用控制器分别在沥青路面和未整修道路上进行了实车实验。实验表明,该控制方法能够实现拖拉机半挂车机组自动直线倒车行驶控制,且车辆的行驶速度对车辆系的横向偏差影响很大。An automatic control method was described for backward motions along rectilinear path of a tractor-trailer combination (TTC) using optimal control theory. Firstly, based on linearization kinematic equation, linear quadratic regulator (LQR) was designed using optimal control. Secondly, via the desired controller, the experiments were carried out in asphalt surfaced and a non-paving way respectively. The experimental results demonstrate that the control method can be successfully used for autonomous tractor-trailer combination along rectilinear path, and the vehicle velocity has a notable influence on the offset of TTC.

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