

基于dSPACE的汽车自动离合器快速控制原型试验 Rapid Control Prototyping Experiment of Automated Clutch Based on dSPACE

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摘要: 针对自动离合器系统存在非线性、时变、参数不确定性等特点,采用滑模控制算法对离合器进行自动控制,以Lyapunov准则对滑模控制器进行了稳定性分析,并基于dSPACE软硬件,进行自动离合器的快速原型试验。试验结果表明,所采用方法能够有效提高自动离合器系统性能,取得了良好的控制效果。Due to the characteristic of non-linear dynamic, time-delays, external disturbance and parameter uncertainty, the automated clutch is difficult to be controlled precisely. A sliding mode controller was introduced to control the automated clutch effectively. The sliding and global stability conditions were formulated and analyzed in terms of Lyapunov full quadratic form. The rapid control prototyping of automated clutch was built based on dSPACE. The experiment results show the controller is effective and robust to the parametric variation and external disturbance.

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