

基于蚁群寻优的汽车牵引力PID控制参数整定

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摘要

将蚁群算法应用于汽车牵引力PID控制参数整定控制器设计。在搭建软件在环仿真平台和硬件在环试验平台的基础上, 调试、标定了控制器参数, 获得了满足实时性要求的查询算法, 进行了典型工况硬件在环试验。试验结果表明: 控制算法能有效改善汽车在弱附着地面的加速性能。

关键词 [汽车工程](#); [牵引力控制](#); [蚁群算法](#); [寻优](#); [PID控制](#); [参数整定](#)

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Regulation of PID controller parameters based on ant colony optimization algorithm in vehicle traction control system

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Abstract The ant colony algorithm was used to design PID controller of traction control system, whose parameters could be adjusted automatically. A software-in-the-loop simulator and a hardware-in-the-loop test bench were erected, the controller parameters were debugged and calibrated, and the algorithm based on lookup table was obtained to meet real time requirement. The hardware-in-the-loop tests on typical roads were made and the test results show that the control algorithm can improve the vehicle accelerating performance on the low adhesion road effectively.

Key words [vehicle engineering](#) [traction control](#); [ant colony algorithm](#); [optimization](#); [PID control](#); [parameter regulation](#)

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