车辆电子稳定性程序神经网络PID控制算法

李静[1]，徐斌[1]，张英锋[2]，刘巍[1]，刘曼远[3]

1.吉林大学 汽车工程学院， 长春 130022; 2.军事交通学院 汽车工程系，天津 300161; 3.邯郸市交通局运输处，河北 邯郸 056002

摘要   设计了面向车辆操纵稳定性控制的车轮制动神经网络PID控制器参数自调整算法，介绍了自行研制的车辆ESP硬件在环试验平台，采用该平台进行了控制算法的台架试验。结果表明：ESP神经网络PID控制算法能有效防止极限工况下车辆丧失操纵稳定性，显著改善车辆的主动安全性。

关键词   车辆工程   主动安全性   电子稳定性程序   神经网络   硬件在环

分类号   U463.54

Control algorithm based on neural network PID controller for vehicle electronic stability program

Li Jing[1]，Xu Bin[1]，Zhang Ying-feng[2]，Liu Wei[1]，Liu Man-yuan[3]

1.College of Automotive Engineering, Jilin University, Changchun 130022, China; 2.Automobile Engineering Department, Academy of Military Transportation, Tianjin 300161, China; 3.Handan Municipal Transportation Management Department, Handan 056002,China

Abstract A neural network was used to design a PID controller with adaptively adjustable parameters for the vehicle stability control program, and a self-developed hardware-in-the-loop simulator was presented. The tests were made to debug the control program with the above   mentioned simulator. The results show that the electronic vehicle stability control program based on the neural network can prevent effectively the vehicle from losing the handling and stability performance under the severe conditions, and lead to significant improvement of the vehicle active safety.

Key words vehicle engineering   active safety   electronic stability program   neural network   hardware-in-the-loop

DOI:

通讯作者 李静 liye1129@163.com

扩展功能

本文信息

▶ Supporting info
▶ PDF(509KB)
▶ [HTML全文](0KB)
▶ 参考文献

服务与反馈

▶ 把本文推荐给朋友
▶ 复制索引
▶ 文章反馈
▶ 浏览反馈信息

相关信息

▶ 本刊中 包含"车辆工程"的相关文章
▶本文作者相关文章
· 李静
· 徐斌
· 张英锋
· 刘巍
· 刘曼远