基于 BP 神经网络的驾驶意图识别系统

摘　要

驾驶意图抽象地形成在驾驶员的脑中，如何使用软件实现驾驶意图的识别尤为重要。在传统汽车向智能化、自动化方向发展的过程中出现了诸多辅助驾驶系统，它们显著提高了汽车的安全性能，同时也可作为一种反映驾驶意图的渠道。本设计通过 MATLAB 中 GUI 功能设计一种驾驶意图识别系统，将驾驶员的操作信号、汽车行驶状态以及辅助驾驶系统的接收信号作为系统输入，借助 BP 神经网络强大的学习能力来满足日常生活中的驾驶意图识别要求。软件设计分为输入显示与综合识别两部分，通过显示的输入曲线更好的分析识别结果，同时在识别过程中，按照驾驶意图不同的紧急程度，再对识别结果进一步区分，最终实现常见驾驶意图的多级识别，具有一定的实用价值。

关键词：驾驶意图识别；驾驶意图识别系统；辅助驾驶系统；BP 神经网络

ABSTRACT

Driving intention is abstractly formed in the driver's mind. How to use software to realize driving intention recognition is particularly important. In the process of the development of traditional automobile to intelligent and automatic direction, there are many auxiliary driving systems, which significantly improve the safety performance of the vehicle, and can also be used as a channel to reflect driving intention. This design uses the GUI function of MATLAB to design a driving intention recognition system, which takes the driver's operation signal, vehicle driving state and the received signal of auxiliary driving system as the system input, and uses the powerful learning ability of BP neural network to meet the requirements of driving intention recognition in daily life. The software design is divided into two parts: input display and comprehensive recognition. Through the displayed input curve, the recognition results can be better analyzed. At the same time, in the recognition process, according to the different emergency degree of driving intention, the recognition results are further differentiated, and finally the multi-level recognition of common driving intention is realized, which has certain practical value.

Key words: Driving intention recognition; Driving Intention Recognition System; Driver assistance system; BP neural network.

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