Fuzzy-based Collision Avoidance System for Autonomous Driving in Complicated Traffic Scenarios

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Abstract

Collision avoidance is an important requirement for safe and autonomous driving in modern transportation system. In this paper, we present a fuzzy based control approach for smart and safe obstacle avoidance in complicated traffic scenario where there are static and dynamic obstacles (e.g. broken-down vehicles, wrong parking road-side vehicles, or moving vehicles, etc.) The fuzzy system makes an optimal decision to control the car throttle, braking, and steering to avoid collision using the available information on the road map (i.e. the distance to obstacles, the current traffic in the neighbouring lanes, the velocity of the front and rear car, etc.). Simulation results from three different scenarios involving a combination of dynamic and static or broken-down vehicles show that the fuzzy controlled car can effectively avoid obstacle or collision in complicated traffic situations.

Keywords

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