AUTOMATIC BRAKING AND SPEED CONTROL SYSTEM USING DEEP NEURAL NETWORKS

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Safety is a necessary part of man's life. Due to the accident cases reported daily on the major roads in all parts of the countries, more attention is needed for research in the designing an efficient car driving aiding system. According to the report of NCRB of India 3,54,796 cases of road accidents during 2020 in which 1,33,201 people died and 3,35,201 were injured and more than 60% of road accidents were caused due to over-speeding, accounting for 75,333 deaths and 2,09,736 injuries. In many road accident cases, a major cause of the accident is the driver distraction and failure to react in time or negligence of the driver or because of failure of braking system to stop the vehicle in time. The number of accidents and the effects of collision can be minimized by reducing the total stopping distance by the developments of automatic braking systems which has led to significant safety in driving. This can be done by systems like Automatic Braking Systems which can be useful as well as helpful.

The purpose of ABSC System is to develop an automated control system that would maintain a safe driving distance from obstacles while driving. This project focuses on developing control system for speed control of vehicle based on the artificial neural networks to curb road accidents and effectively assure safety and stress-free driving. This system will inform the driver about the exceeding speed of vehicle and control it automatically if driver doesn't respond. Automatic braking technologies combine sensors and brake controls to help prevent high speed collisions or to avoid collision. Since high speed crashes are more likely to be fatal than low speed collisions, automatic braking systems can save lives and reduce the amount of property damage that occurs during an accident.

ABSC System basically controls the speed of the vehicle by continuously feeding the driving atmosphere to the pre-trained deep neural network as digital image captured by the camera sensor. Smart user–machine interface (Smart Display & Control) is used for the user efficient interactions between humans and machines. The Neural Network predicts the speed and the amount of braking required. The vehicle's embedded unit automatically alerts the driver to reduce the speed according to the prediction and waits for the user response. If it doesn't get any input from the user, vehicle's SDC unit automatically commands the microcontroller to attain speed predicted by the NN. Through its logic circuits sends the signals to the actuators via its output pins. The actuators apply necessary force on the brakes and maintain the desired speed

with the help of closed feedback control.

The braking system based on the deep learning is intelligent way of brake control which exhibits desirable and consistent brake control behavior for various scenarios where behavior of the pedestrian is uncertain. It can reduce the velocity of the vehicle automatically when a threatening obstacle is detected. The autonomous braking offers safe and comfortable brake control without exhibiting too early or too late braking. This system is more intelligent and prominent over conventional rule-based autonomous braking systems and servers as a principled and goal-oriented system.

GUIDE AUTHORIZED: YES