

## **Fuzzy Logic Based Motor Speed Controlling System for Automobile Industry**

D.A.B. Hemakeerthi\* and W.A.S. Wijesinghe

*Department of Electronics, Wayamba University of Sri Lanka, Kuliyaipitiya, Sri Lanka*

Road safety is becoming an important case in all over the world today. The number of deaths is increasing day by day inroads, due to the uncontrollable speed of drivers and accidental sleepiness while driving. The objective of this project is to develop a system to protect both vehicles and passengers on the road. The main aim of this project is to control the speed of a vehicle automatically by controlling the speed of the motor using fuzzy logic. Which reduces the driver's task for adjusting the gas pedal and checking the speedometer frequently. The research introduced the Fuzzy Logic for speed controlling instead of the commonly used methods such as RF signal controlling method; because Fuzzy logic controllers (FLC) can be used to utilize the human expertise and experience for design controllers. The purpose of using a fuzzy logic-based speed controller is to regulate vehicle speed according to the current speed of the vehicle and the distance between the vehicle and the object in front of the vehicle. The fuzzy controller has developed under three main parts as Fuzzification, Rule base, and Defuzzification. Two inputs were taken to the FLC as 'Speed error' and the 'Distance between vehicle and object Infront'. 49 Fuzzy rules were designed for the fuzzy logic controller in the rule base. The 'Centroid method' was used as the defuzzification method. The 'Mamdani' system which employs fuzzy sets in the consequent part was used in the Fuzzy logic controller. When the speed and the distance were given, the Fuzzy Inference system gives the best matching fuzzified values as the output value. Then it sends to the motor controller. The results show that the fuzzy logic has minimum transient and steady-state parameters, which show that FLC is more efficient. Finally, the Fuzzy controller produces the responses with little high rise-time, but it offers a high percentage exceed and peak amplitude which can result in poor performance of the system.

*Keywords:* Fuzzy logic, Fuzzy Logic controller (FLC), Rule base, Fuzzification, Defuzzification