

## A VEHICULAR ACCIDENT DETECTION AND AVOIDANCE SYSTEM FOR PROTECTING PASSENGERS AND VEHICLES

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### ABSTRACT

Considering the increasing number of traffic accidents in recent years, it is being accepted that traffic accidents have assumed exceptional dimension of a serious problem. Of the major causes of accidents, the driver has been recognised as the main cause of accident especially in Nigeria. As regards to human factor, it is concluded that not so much can be done to improve the level of alertness of drivers or reduce the level of stress experienced by drivers. Hence, Intelligent System is being deployed to vehicles to aid drivers to avoid collision. Existing Collision Detection and Avoidance systems have grown in complexity that the goal of easy integration and maintainability is elusive. This Research has developed a system of Robust Sensors and Actuators coupled to a Rugged Microprocessor to achieve a Low Cost but highly reliable Vehicular Accident Detection and Avoidance System using Ultrasonic Sensors installed in the front end of the vehicle. Analog proximity measurements for various collision hazards were taken and at 40 kilometer per hour and above, the system will be activated. The use of microcontroller for the generation of ultrasonic signal and the control logic enables the prediction of imminent collision when the vehicle approaches an obstacle within 7meters range, thereby enabling some controls which ensure a warning alarm and an activation signal to the automatic brake system when the collision range of 5meters is reached. With the embedded C program in the microcontroller, a visual liquid crystal display is equally incorporated to give situation report of the device surveillance activities. Based on Proteus 7.0 simulation software, the performance of the system is extensively evaluated and the results record satisfactory performance.

**Keywords:** Collision, Detection, Avoidance.