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Design and implementation of an intelligent system for detecting drowsy drivers.

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Abstract

This paper presents a drowsy driver detection system, designed using an AT89C52 microcontroller in combination with smart sensors. Drowsy driving has been discovered to be a major cause of road traffic collisions. The problem lies in the fact that a driver is usually unaware of the on-set of drowsiness. It therefore becomes necessary to design an intelligent system that will know when a driver is getting drowsy and alert him. Before the electronic system was designed, tests were carried out to study driver behaviors for different sex and age categories. The response time to deviation and other important parameters were measured over a 45-minute driving test period and results obtained have been presented. The system developed is a hybrid system, motivated by Mercedes-Benz's drowsy detection system. It is composed of the power supply unit, sensing unit, speedometer, microcontroller unit and driver interface unit. It works based on observations of a driver's behavior at the start of every trip. Initial individual driver's profiles are created and continuously compared with subsequent sensory data obtained during the course of the trip. The monitoring performed detects transition between being awake and drowsiness and warns the driver early enough. The system presented is simple, easily fits into different vehicles, unobtrusive and well suited for the cost implications in Nigeria.

Keywords: Microcontroller-based devices, intelligent systems, Drowsy driver detection

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