CAR ACCIDENT PREVENTION SYSTEM

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ABSTRACT

We have designed car accident prevention system by using MATLAB and embedded system to prevent the accident in case of driver is drowsy or alcoholic. In this system we prevent the car accident by measuring various parameter like temperature, gas concentration and detecting eye blinking of driver. We use the GSM modem to send a message to specific authority in case of accident.

Keyword: *- PIC-controller, Gas sensors, temperature sensor, MATLAB, GSM*

1. INTRODUCTION

Vehicle accidents are most common if the driving is inadequate. These happen on most factors if the driver is drowsy or if he is alcoholic. Driver drowsiness is recognized as an important factor in the vehicle accidents. It was demonstrated that driving performance deteriorates with increased drowsiness with resulting crashes constituting more than 20% of all vehicle accidents. The analysis of face images is a popular research area with applications such as face recognition, virtual tools, and human identification security systems. This project is focused on the localization of the eyes, which involves looking at the entire image of the face, and determining the position of the eyes by a self developed image-processing algorithm. Once the position of the eyes is located, the system is designed to determine whether the eyes are opened or closed, and detect fatigue. By monitoring the eyes, it is believed that the symptoms of driver fatigue can be detected early enough to avoid a car accident. Detection of fatigue involves a sequence of images of a face, and the observation of eye movements and blink patterns.

2. LITERATURE REVIEW

The current system is detecting the eye blinking is from IR sensor, in our project we have modified in such a way that face and eye blinking is detected by web camera and signal is sent to MATLAB for further processing. In case of accident, the message is sent to specific authority through GSM. It also measures the engine temperature and gas concentration which is not present in current system.

3. METHODOLOGY USED

The component used in car accident prevention system are as follows:

A. Camera
B. Gas sensor (MQ6)
C. Temperature sensor (LM35)
D. Accident sensor
E. Controller
F. Buzzer
G. GSM module
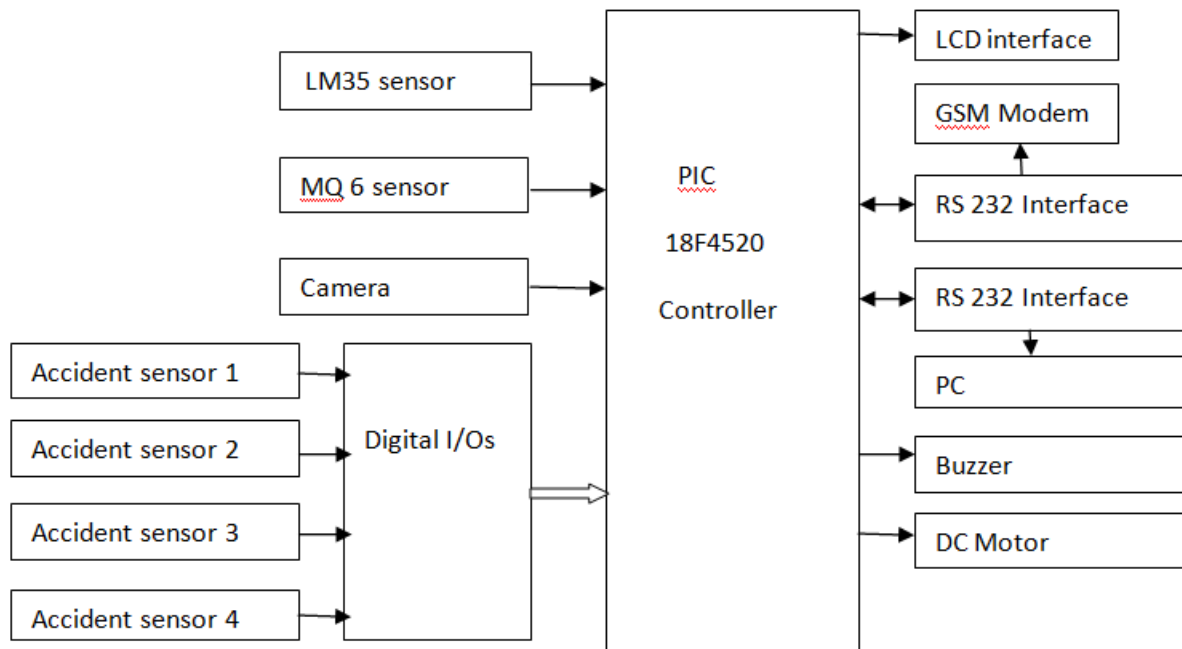
Fig-1: Block Diagram of the system

3.1. Procedure

When system is start, and car is in motion, we will go for eye blink and head movement detection process. A camera is placed that continuously monitors drivers activities related to eye and head movement. In case driver is feeling sleepy and if he closes his eyes or shows any drowsy symptoms that's are captured by camera taking into consideration his/her head movement for more than 3 seconds, then an alarm will be generated as a warning to awake the driver. If driver becomes attentive after the alarm then alarm will stop and camera will record next image. If driver doesn't respond to alarm for another 3 seconds then relay comes in action and turn of the ignition system of car, also a message "Driver Is Sleepy" will be sent to concern authority. It measures temperature and gas concentration if temperature exceeds above 50^0c and gas concentration above 50% then ignition system will get stop.

3.2. Instrument Description

a. Gas sensor(MQ6)
The gas sensor is used to measure the gas concentration and for measure the alcohol concentration. They are used in gas leakage detecting equipments in family and industry, are suitable for detecting of LPG, isobutene, propane, LNG, avoid the noise of alcohol and cooking fumes and cigarette smoke.
*   High sensitivity to LPG, Iso-Butane, Propane
*   Fast response
*   Stable and long life
*   Circuit Voltage: 5V
*   Heating Voltage: 5V

b. Temperature Sensor(LM35)
Temperature sensors are used to measure a temperature of medium. Most commercial and scientific noncontact temperature sensors measure the thermal radiant power of the infrared or optical radiation received from a known or calculated area on its surface or volume within it.
*   Calibrated directly in Celsius.

- Linear +10.0 MV/C scale factor.
- Operates from 4 to 30 V

c. Camera

Camera is used to monitor and record drivers activity related to face and head movement an if eye blink is stop for   more than 3 seconds alarm is generate.

d. PIC controller

In this project we have used PIC 18F4520 controller which have inbuilt ADC. It have 4 crystal modes up to 40 MHz. Supports RS485 & RS232 serial Interface.
 Features:

- The flash memory is 32 Kbytes.
- Data memory (SRAM) is 1536 bytes & (EEPROM) 256 bytes.
- Operating voltage range 2.0V to 5.5V.
- 10 bit, up to 13 channel analog to digital converter module.

e. GSM

This GSM model can accept any GSM network operator SIM card and act like a mobile phone with its own unique phone number .Advantage of using this modem will be that you can use its RS-232 poet to communicate and develop embedded applications.

- Highly flexible plug.
- Highly reliable for 24*7 operation with matched antenna.
- Simple to use and low cost.
- Status of modem indicated by LED.

f. Accident sensors:

 Accident sensor is push to on switch which can be used to generate a pressure to shoe a accident condition. There are four accident sensor we have used in this project.

g. Power supply

We design 5V power supply for circuit and 3.3V for microcontroller.

3. ADVANTAGE

We have used PIC microcontroller which have inbuilt ADC which prevents from external extra circuit. Easily available all parameters in single window. Using GSM actual situation of Accident know. Easily Programmable

4. CONCLUSION

A non-invasive system to localize the eyes and monitor the fatigue was developed. Information about the head and eyes position is obtained through various self-developed image processing algorithms. During the monitoring, the system is able to decide if the eyes are opened or closed. When the eyes have been closed for too long, a warning signal is issued. In addition, during monitoring, the system is able to automatically detect any eye localizing error that might have occurred. In case of this type of error, the system is able to recover and properly localize the eyes.

5. ACKNOWLEDGEMENT

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