ITSP 2015

Driver drowsiness detection

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MOTIVATION:

When people drive while they are tired, drowsy or sleepy, this is commonly referred to as “driver fatigue” or drowsy driving.

Various studies have suggested that around 20% of all road accidents are fatigue-related, up to 50% on certain roads.

Fatigued car drivers often have a difficult time perceiving and processing information. For instance, a driver may not recognize that he or she has drifted into

the wrong lane until it is too late, and a serious car accident happens.

In order to prevent these devastating accidents, the state of drowsiness of the driver should be monitored.

SIMILAR PROJECTS IN PAST:

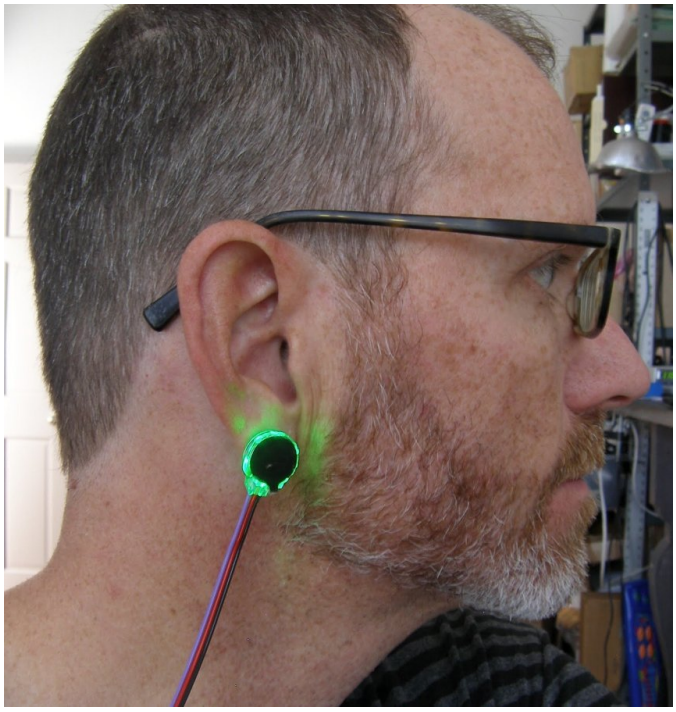
Mercedes-Benz: Attention Assist In 2009, Mercedes-Benz unveiled a system called Attention Assist which monitors the driver's fatigue level and drowsiness based on his/her driving inputs. It issues a visual and audible alarm to alert the driver if he or she is too drowsy to continue driving. It is linked to the car's navigation system, and using that data, it can tell the driver where coffee and fuel are available.[7]

BMW:Active Driving Assistant with Attention Assistant analyses driving behaviour and, if necessary, advises the driver to rest. The advice to take a break is provided in the form of graphic symbols shown on the Control Display.

BASIC ALGORITHM and AIM:

We will be designing a cap to be worn by the driver which will consist of accelerometer sensors for analysing head orientation of the driver ,when the driver will be drowsy it is more likely that his head orientation will be much more deviated than normally ,this will be the basis for analysing data from this sensor.

Also a pulse rate sensor will be attached to earlobe of the driver and connected to the Arduino which will monitor pulse rate of the driver.



Average human BPM results :

MALES	FEMALES
NORMAL AVERAGE	
75 bpm <bpm<100bpm	70bpm<bpm<95bpm
INDICATION OF DROWSINESS	
50 bpm <bpm <65bpm	45bpm<bpm<63bpm

This will form the basis for pulse rate data analysis.

A COMBIATION OF DATA FROM THESE 2 SENSORS WILL PROVIDE THE NECESSARY INDICATION OF DRIVER DROWSINESS.

DEMONSTRATION:

We will be making a prototype of driver drowsiness detection system and demonstrating it on a Arduino controlled bot.

Our project will include direct user interaction to demonstrate functioning of our system .

TIMELINE:

Week 1: - buying all the components - Making of bot

-studying and research related to driver drowsiness systems

Week 2: -Learning about pulse rate sensor

-Learning about accelerometers

-Integrating them into the project

Week 3: -Learning how to use Xbee and it's integration

with Arduino.

Week 4: - reserved for further research and adding additional elements into the project.

-if possible work on eye blink detection algorithm.

-finalising the code.

Week 5: -Troubleshooting of the project.

-Testing accuracy of the system

-Adding aesthetics to the final product.

COMPONENTS REQUIRED:

PC preferably running Windows 8

Arduino Uno or compatible(3) + power source.

XBee(2)

Pulse rate sensor

3 Axis Accelerometers

Buzzer

Vibrator

300 rpm motors(2)

Chassis and wheels(4)

IC 7805 and 7809

L293D

Lead Acid Battery (12V)

Breadboard and PCB

Jumper wires.

ESTIMATED COST: Around 9000/-