Software Requirements Specification

for

Smart Driving

Version 1.0

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1. Introduction

1.1 Purpose

The purpose of the project is to use powerful technologies to solve the problem of distractions to the driver while driving. Project uses various computer vision algorithms to detect and alert the driver.

1.2 Scope

The project focuses on providing cutting edge technology to prevent road accidents. Project can be used to reduce the rate of casualties by road accidents due to distractions. The project focus on providing overall comfort to drivers.

2. System Interfaces

2.1 Hardware interface

Hardware consists of raspberry pi,a GPS module and a camera module. Power supply to the module will be given by the battery of the car and access of internet will be provided to the module via hotspot of the mobile phone.

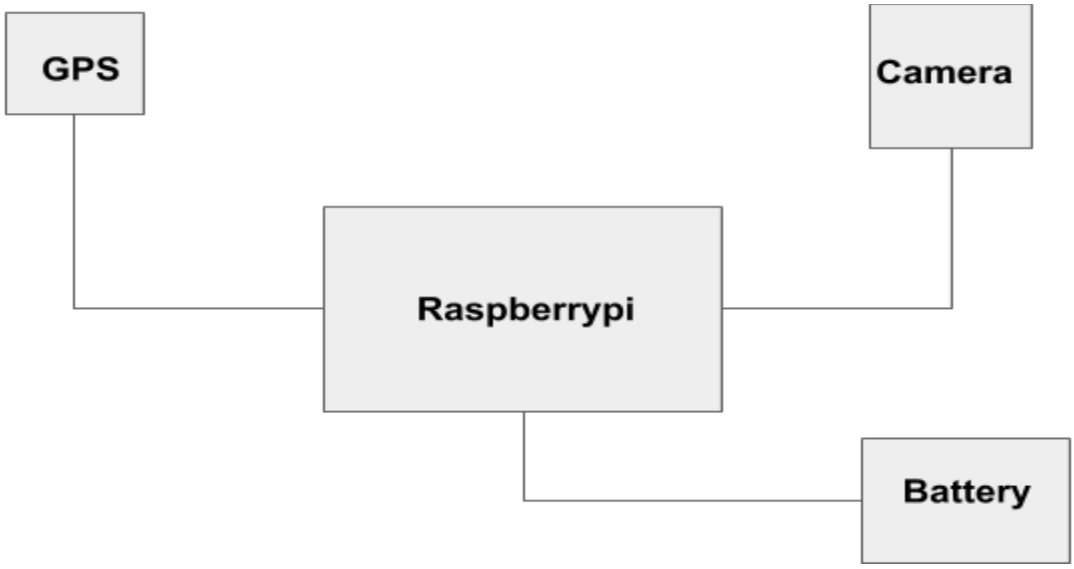

Figure 1. Block diagram of the hardware

2.2 Software Interface

The software in the module is a python script which manages all the working of the module.three main scripts are provided

1. *Drowsiness detection script*
2. *SOS calling script*
3. *Hand gesture recognition script*
4. *Near-by places script*

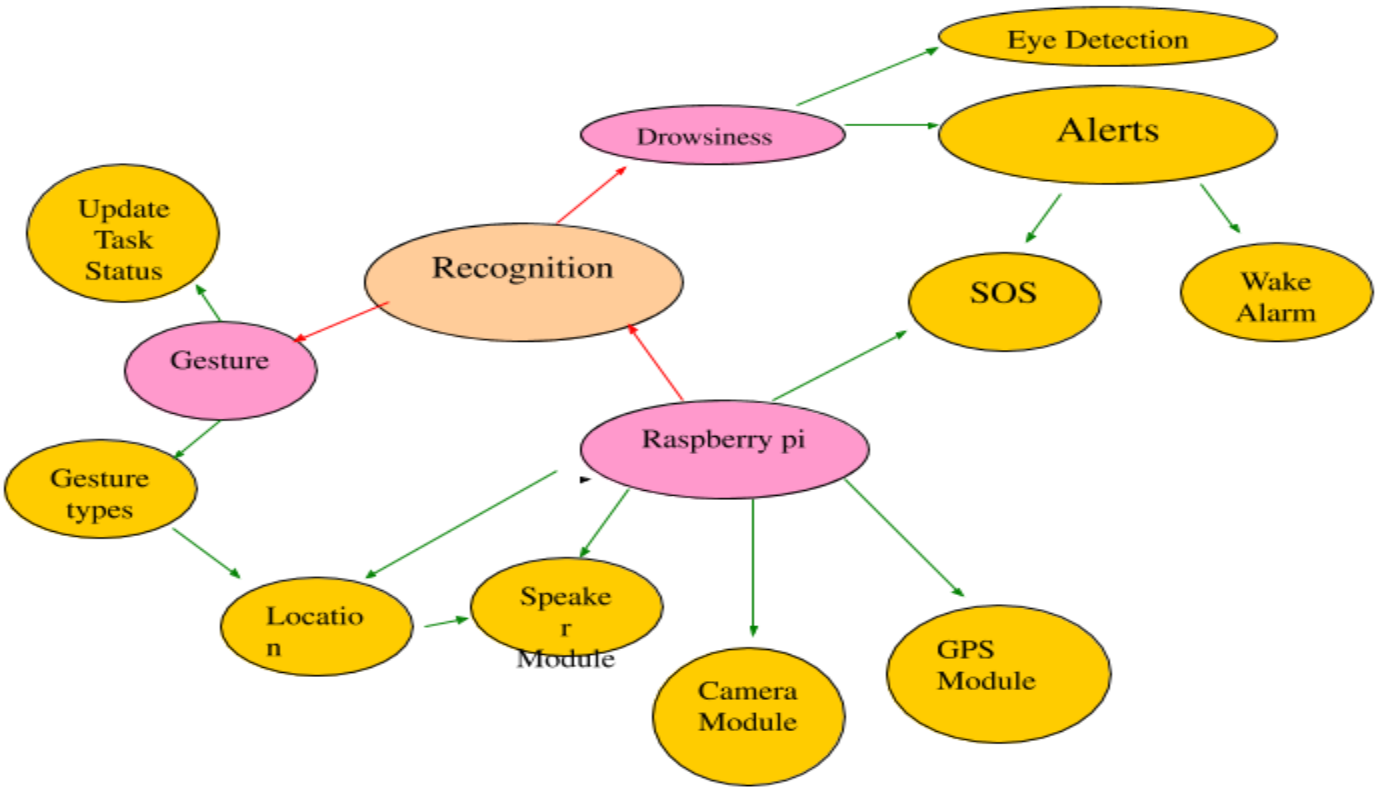

Figure 2. Block diagram for the software and hardware integration along with features.

3.Product Functions

3.1 Search nearby places

1. *First it collects exact gps location of the driver using the GPS module embedded with the raspberry pi.*
2. *Initiates the Google Places api and send the GPS coordinates to it.*
3. *Receives 10 nearby places and finds the distance between those GPS coordinates and current location using google Distance Matrix api.*
4. *Speaks the nearest place and its distance using gTTS python library.*

3.2 SOS calling

Twilio platform is used for making SOS calling to registered family members

3.3 Drowsiness Detector

1. *First, we'll set up a camera that monitors a stream for faces.*
2. *if a face is found, we apply facial landmark detection and extract the eye regions.*
3. *we can compute the eye aspect ratio (detailed here) to determine if the eyes are closed.*
4. *If the eye aspect ratio indicates that the eyes have been closed for a sufficiently long enough amount of time, we'll sound an alarm to wake up the driver:*

4. Limitations

The module cannot work when there is no internet connection.

5. Future implementation

1. *Google assistant integration.*
2. *Driver authentication.*
3. *Integration with mechanical parts of a car*.