International Journal of Engineering Science Invention (IJESI)
ISSN (Online): 2319 – 6734, ISSN (Print): 2319 – 6726
www.ijesi.org ||Volume 7 Issue 6 Ver III || June 2018 || PP 61-68

Disha- A Personal Assistant For Driver

Dr Shubhangi D.C, Ameena Begum
HOD Dept. Of CS & Engg, VTU PG Center, Kalaburagi, Karnataka, India.
PG Student Dept. Of CS & Engg, VTU PG Center, Kalaburagi, Karnataka, India.
Corresponding Auther: Dr Shubhangi D.C

***Abstract**: - One of key objective of DISHA to develop the android application is that the digital society is at a risk immense risk to road safety, and there is need to fix this, to ensure driver and other safety, during the use of smart phone. In order to perform various task on phone like attending calls, SMS, Whatsapp messages, email and navigation. In proposed work we are focusing to get routine information during navigation, receiving customize information about live traffic, which helps individual drivers to drive to their destination. To receive/make calls, read/write SMS and whatsapp messages, play music from music player with no touch device.The application DISHA shows the incoming notifications using broadcast receiver from Whatsapp, SMS, and Email. messages and calls which can be answered without using mobile phone, rather using voice assistant and hand gesture by hardware using sensors.The system (DISHA) uses machine learning to have an interactive assistant with the driver. It is capable of listening to the driver command using speech recognizer, and processing it and providing the appropriate answer.*

***Keywords:** DISHA, Machine learning, Speech recognizer, Hand gesture, Sensor, Broadcast Receiver.*

Date of Submission: 02-06-2018 Date of acceptance: 18-06-2018

I. Introduction

A major problem associated with the driving is rapid growth in automobile industry is an increase in traffic congestion and accidents.

Smart phones are the single factor that has caused the highest number of traffic accidents in recent years. Despite cars and their safety concepts are developing for couple of decades, mobile networking and the internet are an integral part of our modern connected lives. This is why 10-in-2 smartphone users tap into social media while driving, 48% surf the net and 20% video chat. Even though everyone knows the danger and prohibition by law. Still many people write text messages, set the navigation or flick through documents quickly on the way to the office while behind the wheels.

These innovations from decades are totally indispensable in today's world. The car driver sits behind the wheel and fastens his seatbelt as if it were second nature. But just as unconsciously the driver today glances down at his mobile phone as wella huge new safety risk. Smart phones are the single factor that has caused the highest number of traffic accidents in recent years.

Well, that is what millions of people do every day. You drive blindly on the highway for more than 180 meters, if you are distracted by Internet or SMS.

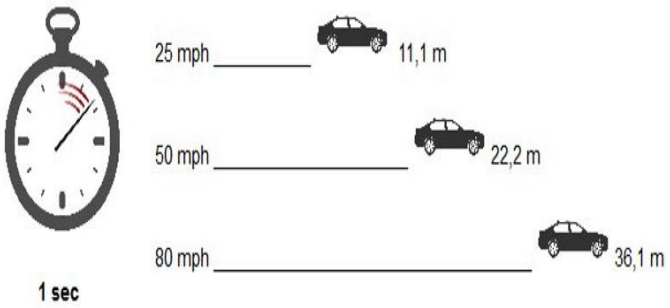


Figure 1: Speed comparision

So new safety concepts must be established that are useful and still not a threat to the joys of driving or using the smart phone. The goal is to create a future in which we look back and are just as horrified about today's driving habits as we are today in the absence of the safety belt in the 70's. And, of course: to make the car safe again without turning off the awesome gadgets of today's digital age.

II. Related Work

The proposed model has been reported literature on the development of the application.

Petros et al [1] developed the application for getting the routine information about traffic and also information about parking place to reduce the stress of driver. The J. C. Miles et al [2] develop the intelligent transport system for changing the lanes of vehicle to avoid the accidents based on the speed of vehicles. The application uses the methodology of Jun-Juh Yan et al [3] to prevent the fatigue and drowsiness for safe driving and also to detect the pedestrians on the road suggested by David Geronimo et al in [4].

The application uses the method of text to speech using speech recognizer for telecommunication [5] and for wireless communication between the hardware device and mobile phones [6] using HC-05. The concept of machine learning of speech recognition for good human computer interaction system [7] and for attending the calls using hand gesture [8].

Converting the SMS in the form of speech to text while driving [9] for reading the sms as well. To change the music track using IR sensor is done with the strategy by [10].

Barış Guksa et al [11] developed the detection of the speed of the car by using global positioning system. The frequency of head tilting and blinking of the eyes was used to determine whether or not a driver felt drowsy [12]. The navigation information about the direction using google map [13]. While driving for attending calls and sms and replying of sms done using stored contacts from mobile phone [14].

III. Methodology

The proposed model mainly focus to get the correct routine instruction, navigating direction using google map, receiving correct information to reach to his destination using the system DISHA. By this the driver can make use of receive/send whatsapp message, receive/send sms, receive/send mails through voice using speech recognizer, play the music from the music player, using the hand gesture to change the music track. Using these features the driver can easily interact with the application without any driver interface so that he can reach to his destination within time, also saves the energy and fuel.

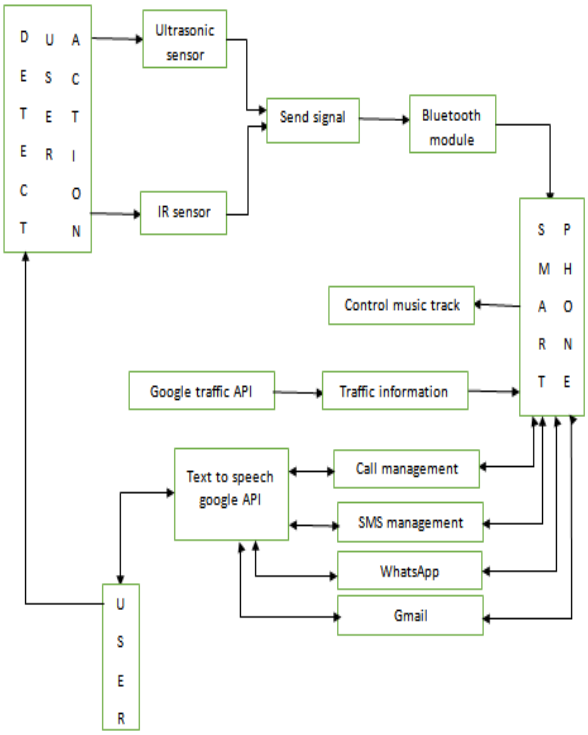


Figure 2. System Architecture

Figure 2. shows the system architecture in which the command has been given from the smartphone using automatic speech recognizer, and that command has been processed and perform the task like sending or receiving sms, whatsapp message and emails, to make or receive calls without any human physical inteventions. Our proposed system has the following modules:

Module 1: SMS
Algorithm 1:
Step 1: Start the application.
Step 2: Give a command as "message someone".
Contacts can be accessed by using **ContactsContract** class.
Step 3: Speak the content of message using speech recognizer.
Step 4: Sending sms by **SmsManager.getDefault.sendTextMessage ().**

In this module our application will send SMS (Short Messaging Service) to the specified users by using SmsManager tools, the contents for SMS will be taken from the voice by speech recognizer with handler for some amount of time and also it will receive and read the incoming SMS from the different users by using the broadcast receiver services and methodologies.

Module 2: Email
Algorithm 2:
Step 1: Give command as "email someone", the
Email address can be accessed from **ContactsContract** class which contains mail id.
Step 2: Set up the property with the protocols
Properties.setProperty(**"mail.transport.protocol"**,**"smtp"**);
Properties.setProperty(**"mail.host"**,**"smtp.gmail.com"**);
Step 3: Provide the content with subject using speech recognizer.
Multipart multipart = **new** MimeMultipart();
BodyPart bodyPart = **new** MimeBodyPart();
Step 4: Sending an email.

In this module driver can send the mail to the specified user by using different intent objects and also this application will receive the mail. The reading and writing of subjects and contents can be done by Text To Speech class in Android Studio. Hence sending and receiving of mails can be done by using speech recognizer with handler for specified amount of time.

Module 3: Whatsapp
Algorithm 3:
Step 1: Speak out "Whatsapp someone" the contact list can be accessed from
ContactsContract class.
Step 2: Sending the message using class packageInfo
PackageInfo info=pm.getPackageInfo("com.whatsapp", PackageManager.GET_META_DATA);
Step 3: Set the package. Use the intent object to send the message.

Here the application will receive the whatsapp message from the particular contact and that will be read by speech recognizer whenever there is an incoming whatsapp message as well as it sends the whatsapp message to different user using contact list, message will be extracted by Text To speech recognizer by using whatsapp libraries.

Module 4: Call
Algorithm 4:
Step 1: Say "call someone", the contact list can be accessed from
ContactsContract class.
Step 2: To make a call the android studio requires
String dial = **"tel:"** + **phoneNo**;
startActivity(**new** Intent(Intent.**ACTION_DIAL**, Uri.parse(dial)));

The driver call to anyone from the contact List by telling the names which are in the contact list by using intent objects shown in algorithm 4, and it also tells the name of the incoming call user by using broadcast receiver. The receiving and disconnecting the calls can also be handled by hand gesture methods which can be done ultrasonic sensor.

Module 5: Play Music
Algorithm 5:
Step 1: Say "play music", the list of songs has to be store in resource file.
Step 2: The application will play the music using

MediaPlayer=MediaPlayer.create(MainActivity.**this**,R.raw.**song_name**);
MediaPlayer.start();
Step 3: The track can be changed by using two IR sensors with Arduino setup.
In this application we can play the music from the music player in the car by telling and also we can change the songs by hand gesture using IR sensors by using Media Player objects.

Module 6: Navigate Direction

In this module the application will show the current location using Google Map Api and also it will suggest the directions to the desired location using directions api with giving traffic information.
Algorithm 6:
Step 1: It shows the current location using
Latitude=Location.getLatitude();
Longitude=Location.getLongitude();
Step 2: Get the location by speaking name of the city using
Geocoder geocoder=**new** Geocoder(MapsActivity.**this**);
Addresses=geocoder.**getFromLocationName**(**area**,10);

Module 7: Weather Information
Algorithm 7:
Step 1: It shows the temperature of current location usingTemperature = String.format ("%.2f", main.getDouble ("temp"))+ "°";
Step 2: It shows the humidity of current location using
humidity = main.getString ("humidity") + "%";
Step 3: It shows the pressure of current location using
Pressure = main.getString ("pressure") + " hPa";
Step 4: weather has been updated using
updatedOn = df.format (new Date(json.getLong("dt")*1000));

The application will collects the data from the weather and it will speak the information about the temperature, humidity, pressure, weather description and weather update whenever there is input from the speech recognizer about weather.

IV. Experimental Setup

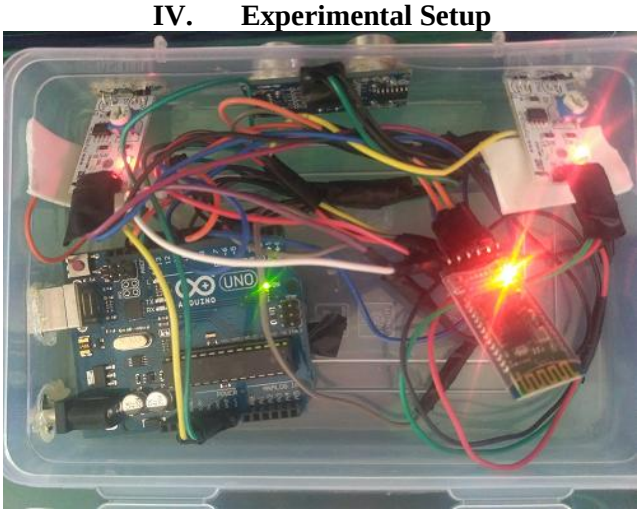


Figure 3: Hardware setup sensors with Arduino

Figure 3 shows that the hardware setup with Arduino board. It consist of Arduino board, Bluetooth HC-05, IR sensors, Ultrasonic sensor. The IR sensor has been connected to Arduino board by using tx, rx, and ultrasonic has been connected to Arduino board with pin no 13. The power supply has been given from the external power supply either from battery or from the serial cable; the whole hardware setup can be connected by using jumper wires.

The whole hardware setup has been integrated with the android application, the values from the sensor will receive to the android application, the android application will receive the values and perform their respective task.

The IR sensors in the application is used to change the track of the music player. The ultrasonic sensor is used to receive the calls or disconnect the calls.

V. Results And Discussions

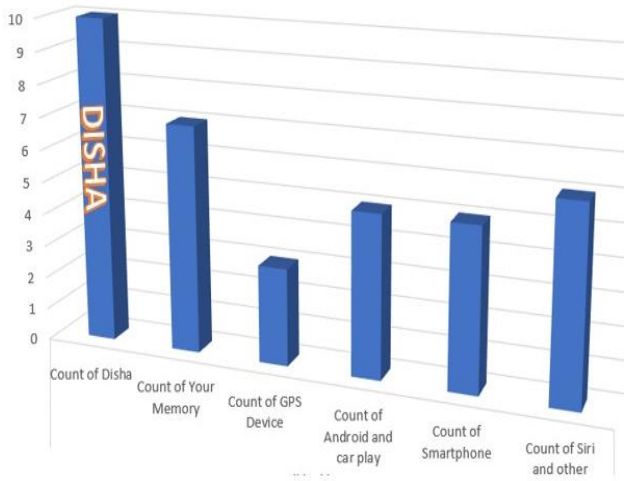
The "DISHA a personal Assistant for driver" is the proposed application where the driver uses this application while driving to reduce the number of accidents on the road.

The comparison of the application and the other products that are used for navigating and act as assistant is shown. The values in the table compares the application whether the application will supports the features or no shown in table 1.

Comparison chart	Disha	Smart phone	Siri and other	Android and car play	GPS Device	Your Memory
Service	YES	YES	YES	NO	YES	YES
Works in every car	YES	NO	YES	YES	NO	YES
Listens and talks to you	YES	NO	NO	NO	NO	NO
Gesture control	YES	NO	YES	YES	NO	YES
Learns and responds	YES	YES	NO	NO	NO	YES
WhatsApp / Messenger	YES	YES	YES	YES	NO	YES
Make and receive calls	YES	YES	YES	NO	YES	YES
Offline navigation	YES	NO	NO	YES	NO	NO
Playing Music	YES	YES	YES	YES	YES	YES
Fun to drive	YES	NO	NO	NO	NO	NO

Table 1: Comparison Table of Disha with other assistant

The comparison chart of Disha with other application assistant is been done and the values can be measured by comparing the features. The graph chart with respect to the table 1 is shown below.



Comparision chart of DISHA with other Assistant

Thus system runs on the android devices which are connected with sensors using Arduino like IR sensor for changing the music track either next song or previous song, Ultrasonic sensor for handling the calls like connecting or disconnecting and to increase or decrease the volume of the music. This all values of the sensor will pass to the application using HC-05 module for communication between Arduino Uno and the android device.

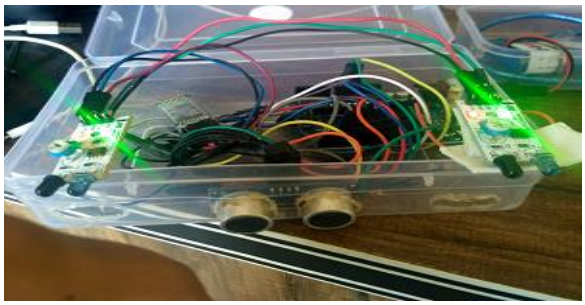


Figure 4: working module with hardware

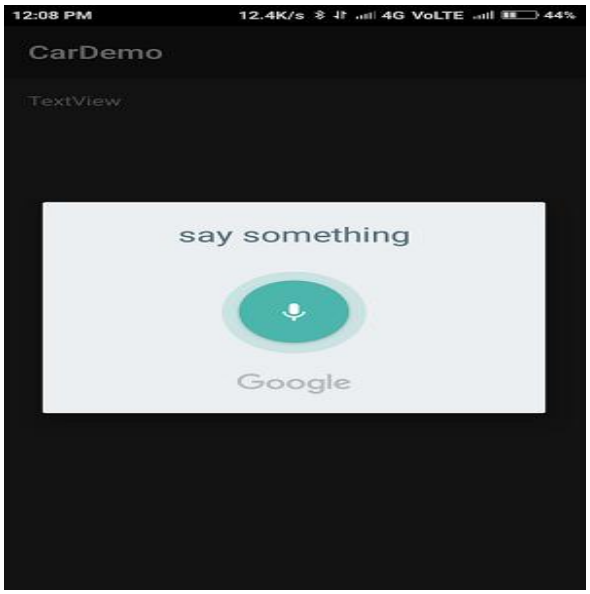


Figure 5: Speech recognizer, start of the application which recognize the speech.

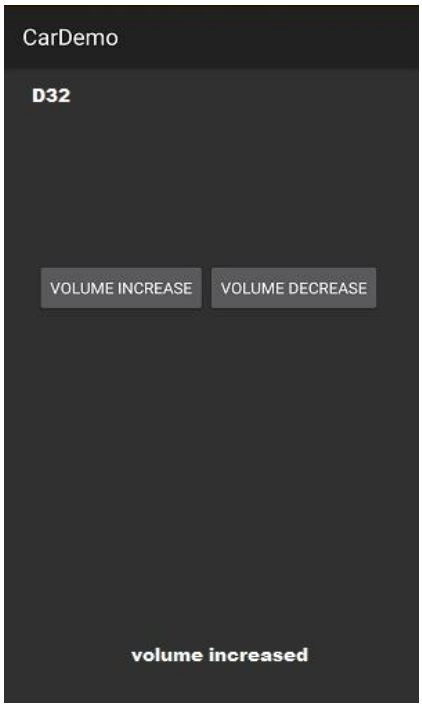


Figure 6: shows the message of volume increases that has been done using right IR sensor.

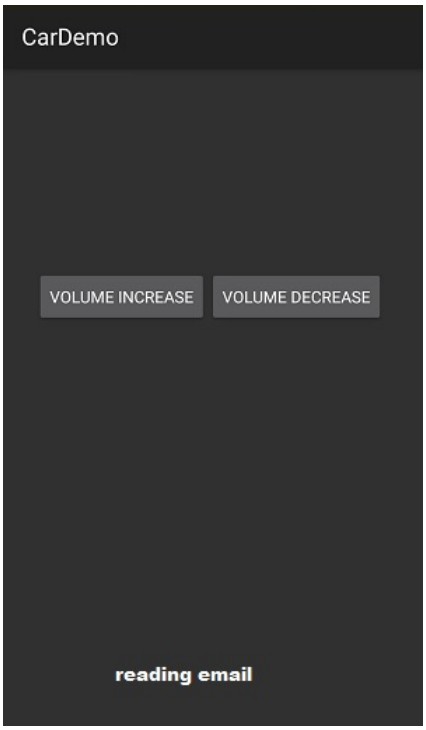


Figure 7: message of reading an email whenever there is an incoming mail.

VI. Conclusion And Future Scope

DISHA a personal assistant for driver, works and how the interaction between the driver and the smartphone through IR sensor, ultrasonic sensor and Bluetooth is been carried out. In this the driver can easily listen different incoming messages such as SMS, EMAIL, WHATSAPP and he can also respond back and send the message. The driver can activate the music player by giving commands through voice, it also support to change the track using hand gesture of IR sensor and also he can get the navigation properly using google server as well as he can also attend the calls by hand gesture using ultrasonic sensor. By this application the driver can concentrate only in the driving with no disturbance from messages and calls so that he can reach to the destination safely on time i.e drivers can save the time and the chances of accidents because of smartphone can be avoided.

The future enhancement can be done by the use of accelerator sensor connected to the application so that in case of accident the accelerator sensor will trigger the message to the family member or friends, from that there would be chance of saving lives.

References:

[1]. Petros Ioannou; Yihang Zhang "Intelligent driver assist system for urban driving" in Digital Media Industry & Academic Forum (DMIAF) 2016.
[2]. J.C.Miles; A.J.Walker"The potential application of artificial intelligence in transport"inIEEProceedingsIntelligent Transport System s Year: 2006, Volume: 153, Issue: 3
[3]. Jun-Juh Yan; Hang-Hong Kuo; Ying-Fan Lin; Teh-Lu Liao in "Real-Time Driver Drowsiness Detection System Based on PERCLOS and Grayscale Image Processing" in International Symposium on Computer, Consumer and Control (IS3C) 2016
[4]. DavidGeronimo; AntonioM.Lopez; AngelD.Sappa; ThorstenGraf"Survey of Pedestrian Detection for Advanced Driver Assistance Systems" in IEEE Transactions on Pattern Analysis and Machine Intelligence***Year: 2010, Volume: 32, Issue: 7***
[5]. Sneha Lukose; Savitha S. Upadhya "Text to speech synthesizer-formant synthesis" in International Conference on Nascent Technologies in Engineering (ICNTE) 2017
[6]. R. K Yadav; Himanshu Vohra "Design architecture and comparison of interactive smart button using HC-05 and ESP8266" in International Conference on Computing, Communication and Automation (ICCCA) 2017
[7]. Soumya Priyadarsini Panda "Automated speech recognition system in advancement of human-computer interaction" in International Conference on Computing Methodologies and Communication (ICCMC) 2017
[8]. Chen Ke; Chen Bingyan; Liu Changyu; Fang Peisen; Gan Yulin; Zhou Yan "Circuit system design and test for single ultrasonic detection sensor" in 13th IEEE International Conference on Electronic Measurement & Instruments (ICEMI) 2017
[9]. Intan Sari Areni; Sri Wahyuni; Indrabayu; Anugrahyani "Solution to abbreviated words in text messaging for personal assistant application" in International Seminar on Application for Technology of Information and Communication (iSemantic) 2017
[10]. Yu. Savchenko**;** D. Beklemishev**;** A. Pereverzev "Building a highly sensitive IR sensor for short-range optical location" in IEEE NW Russia Young Researchers in Electrical and Electronic Engineering Conference (EIConRusNW) 2016
[11]. Barış Guksa; Burcu Erkmen "Smart phone application for drowsiness detection during driving" in 2nd International Conference on Frontiers of Sensors Technologies 2017

[12]. Oraan Khunpisuth; Taweechai Chotchinasri; Varakorn Koschakosai; Narit Hnoohom "Driver Drowsiness Detection Using Eye-Closeness Detection" in 12th International Conference on Signal-Image Technology & Internet-Based Systems (SITIS) in the year of 2016
[13]. KomangCandraBrata; AryoPinandito; MahardekaTriAnanta; NurizalDwiPriandani"Design of public transportation navigation system on android wear device" in International Conference on Sustainable Information Engineering and Technology (SIET) 2017
[14]. Vinz Enjel C. Punay; Hillary S. Briones; John Carlo L. De Leon; Josephine E. Petralba "unDivided: An android application for anti-distracted driving" in International Conference on Orange Technologies (ICOT) 2017

Dr Shubhangi D.C "DISHA- A Personal Assistant For Driver "International Journal of Engineering Science Invention (IJESI), vol. 07, no. 06, 2018, pp 61-68