A REVIEW ON VEHICLE ENGINE START AND STOP CONTROL SYSTEM USING SPEECH RECOGNITION

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Abstract*:* Safety and security plays an important role in every one's life. With advancement in technologies, advanced systems are incorporated in human life to protect the happiness. There is a growing demand for systems which are capable of theft detection for security purpose. With the advancement of vehicle technology, the security system inside the vehicle is of utmost importance. Many scientist and researchers have developed various systems to avoid the theft of vehicles. They have implemented speech recognition system to identify the voice of owner and responded accordingly. Based on the review of various systems, we have proposed our intelligent system which utilizes hearing sensor and the speech synthesis to the start and stop of vehicle. This low cost system can benefit to every category of human race.

Index terms- Hearing sensor, Microcontroller, speech recognition, Vehicle;

I.INTRODUCTION

Over the past few decades, there is much improvement in the technology for safety and security of vehicles. Much effort has been made to reduce the crime related to the vehicle stolen. Because now a days, according to the statistics of ' National Crime Records Bureau, India', crime related to stolen vehicles have drastically increased [1]. The security system should be capable of performing reasonably well even in unfavorable conditions to meet the desired level of security [2, 3].

So solution to vehicle safety is to develop a system to communicate with the vehicle. Speech recognition technology is a great aid to admit this challenge and it is a good technology for Human-Computer Interaction and Human-robot Interaction. Speech recognition allows user to provide input to an application with user's voice. Just like clicking with the mouse, typing on the keyboard, or pressing a key on the phone keypad provides input to an application, speech recognition allows the user to provide input by talking.

The goal of this type of security system is to detect the familiar voice and should not respond to unauthorized one. The system must consist of speech processing system that must be capable of identifying the familiar voice. If so then microcontroller will command the motor to run the vehicle. Using this type of security feature, can make the system efficient and help user to protect their vehicles. Next section gives the review of some of the developed systems.

II. DIFFERENT DEVELOPED VEHICLE INTELLIGENT SYSTEMS

Various systems have been developed to interact with the machines. For the safety of vehicles, researchers have developed various systems. These systems operate on human voice. As soon as system detects the owner's voice, these systems got activated. Review of some of the system is given in this section.

Sarabjeet et al had developed a system for car which was controlled by human voice. They have used the concept of speech recognition algorithm and algorithms that worn for the command of the users.

Identification process is started by pressing a button on remote then speech recognition process start. Then user commands the system to open various windows of vehicle. This system was developed for windows only [4].

Implementation of the embedded system design for controlling automobile peripherals automatically through voice recognition system was presented by Muhammad Tahir Qadri et. Al.. Authorize user profile was stored in the system which carried specific settings for the user. When the user wished to drive the car, system would activate the personal settings by recognizing the user's voice which included the setting of the side and rear mirrors and seat adjustments. The real time snapshot of the driver was also taken using DM642 media processor and displayed on the LCD screen. The smart car can also be remotely locked or unlocked using GSM modem. Another feature of navigation and tracking of car using GPS module was also included in the system. The system takes latitude and longitude positions from GPS and sends to the PC using GSM modem. The real time location of the car is further displayed on the map on PC. The system was really nice but many safety features made the system a bit costlier [5].

One of the researcher have developed robotic vehicle that can be operated by the voice commands given from the user. Speech recognition was used in the system for giving &processing voice commands. The speech recognition system used an I.C called HM2007, which stored and recognized up to 20 voice commands. The R.F transmitter and receiver were used, for the wireless transmission purpose. The micro controller used was AT89S52, to give the instructions to the robot for its operation. This robotic car can be able to avoid vehicle collision , obstacle collision and it is very secure and more accurate. System was developed to target physically disabled persons [6].

A system was developed to monitor the level of the toxic gases such as CO, LPG and alcohol inside the vehicle and provide alert information in the form of alarm during the critical situations. And also send SMS to the authorized person via the GSM. An IR Sensor is used to detect the static obstacle in front of the vehicle and the vehicle gets stopped if any obstacle is detected. This may avoid accidents due to collision of vehicles with any static obstacles [7].

A.B. Muhammad Firdaus et. al. had developed a system whose objective was to make a car controlled by voice of human. An essential pre-processing venture in Voice Recognition systems was to recognize the vicinity of noise. Sensitivity to speech variability, lacking recognition precision, and helplessness to mimic were among the principle specialized obstacles that kept the far reaching selection of speech-based recognition systems. Voice recognition systems worked sensibly well with a quiet conditions however inadequately under loud conditions or in twisted channels. The key focus of the project was to control an electric car starter system [8].

One of the researchers had developed an intelligent vehicle and had given its design and implementation using ARM cortex M4 as core controller for the purpose of safe and comfortable driving. Since ARM cortex M4 came with many different features such as high efficiency, low cost and low power consumption. This system used the speech recognition principle to improve the interaction between the human and machine. The system was successful in giving experimental results for five voice commands that are forward, backward, left, right and stop. The highly accurate ultrasonic sensor was used to detect the objects around the car. The system used the CNG sensor which is highly sensitive to natural gas to detect the leakage of CNG from CNG kit, which is mostly used in vehicle nowadays [9].

Advance security system for car had been developed by Saranya V, which consist of a face detection system, a GPS module, a GSM module and a control platform. The system was mainly used to identify the car and the thief who theft the car. FDS (Face Detection System) was used to detect the

face of the driver and compared it with the port folio. When the owner detects that his car was lost, then immediately he can transfer the message from his mobile with the specified SIM which was predefined in the car module. The control depends upon the message received. The owner can able to perform door locking, car stopping, and alarm generation through message from his mobile. Location of car was detected using the GPS module when the stop comment is passed from the owner and transfers location as longitude and latitude information along with the operation performance acknowledgment. So using this system the detection of thief image and the location of the car were simply smart and cheaper than traditional one [10].

A simple and reliable system has been designed which give an alert in the form of a text message as soon as any problem arises. The problems in the developed system may range from theft to accidents. Minute changes like ignition on and off could also be controlled. Operation of system is based on speech commands or speech control signals like 'stop', 'left', and 'right', back, 'go' and so on [11].

This section has given the review of different developed systems. Some were really good prototype. Actual implementation was a bit challenging. With the advancement in technologies and low cost components, it is possible to design a new improved low cost system

III. PROPOSED SYSTEM

The block diagram of proposed system is as shown in fig1. Here, person can communicate with the vehicle with the help of hearing sensor. The spoken instructions are fed to the computer via microcontroller. Controller will look after the proper execution of command. The spoken instructions are given to speech recognition system. After recognizing the instruction, microntroller will sense the command from pc and respond accordingly. If the words are recognizing then controller will operate the motor to ON the motor and if the command didn't match then vehicle will not respond.
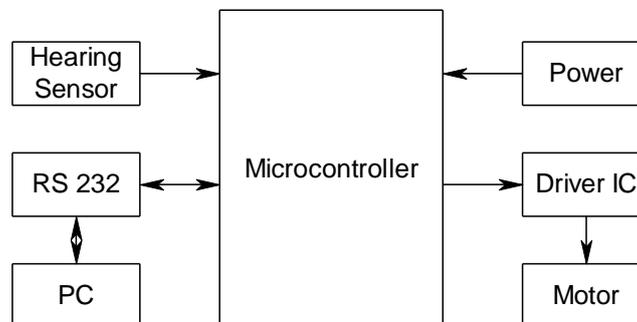

Fig 1. Basic block diagram of system

IV. CONCLUSION

As we know security plays an important role in every ones life. Vehicle security is the growing area of concern. Various systems were developed to address the problem. This paper has given the review of these systems. The basic theme of every system was to develop a speech processing system that could analyze the command from the user. After reviewing many systems, we have proposed our system that can be easily implemented and will prove to be low cost. System use hearing sensor to take command from the user. If any unauthorized person wants to drive the vehicle then system will not on the vehicle. Thus system can be beneficial for safety of vehicles.

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