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# Speech Recognising Car Using LabVIEW

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**ABSTRACT:** There are many accidents happening due to drivers being stressed upon controlling the situation, which is the source or background of the problem. Instead of giving permission to control everything to an AI or a controller, we (Drivers) are going to control the vehicle. This is an effort to reduce the stress and pressure of drivers while driving a vehicle. The novelty of this project is that the vehicle is controlled using voice recognition. The objective of this project is to reduce the accidents due human error which is basically because of stress and pressure they undergo, to be safe while driving by using voice control with the help of NI LabVIEW and NI myRIO.

**KEYWORDS:** NI LabVIEW, NI MyRIO, Voice control, Voice recognition.

## I. INTRODUCTION

In this modern age vehicle plays a crucial role in the day-to-day life of human beings due to which the number of vehicles is getting increased eventually the accidents also increases. The major reason for every accident is lack of concentration in drivers. To reduce the efforts of drivers various methodologies are available and are undergoing researches too.

**TABLE 1: NUMBER OF ROAD ACCIDENTS IN TOP 15 STATES & RESPECTIVE SHARES IN TOTAL ACCIDENTS IN 2019**

| S.No. | State | No. of Accidents |
|---|---|---|
| 1 | Tamil Nadu | 65,562 |
| 2 | Madhya Pradesh | 53,399 |
| 3 | Karnataka | 42,542 |
| 4 | Uttar Pradesh | 38,783 |
| 5 | Kerala | 38,470 |
| 6 | Maharashtra | 35,853 |
| 7 | Andhra Pradesh | 25,727 |
| 8 | Telangana | 22,484 |
| 9 | Rajasthan | 22,112 |
| 10 | Gujarat | 19,081 |
| 11 | Chhattisgarh | 13,563 |
| 12 | West Bengal | 11,631 |

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| | | |
|---|---|---|
| 13 | Haryana | 11,258 |
| 14 | Odisha | 10,855 |
| 15 | Bihar | 8,855 |
| | Total 15 States | 4,20,175 |

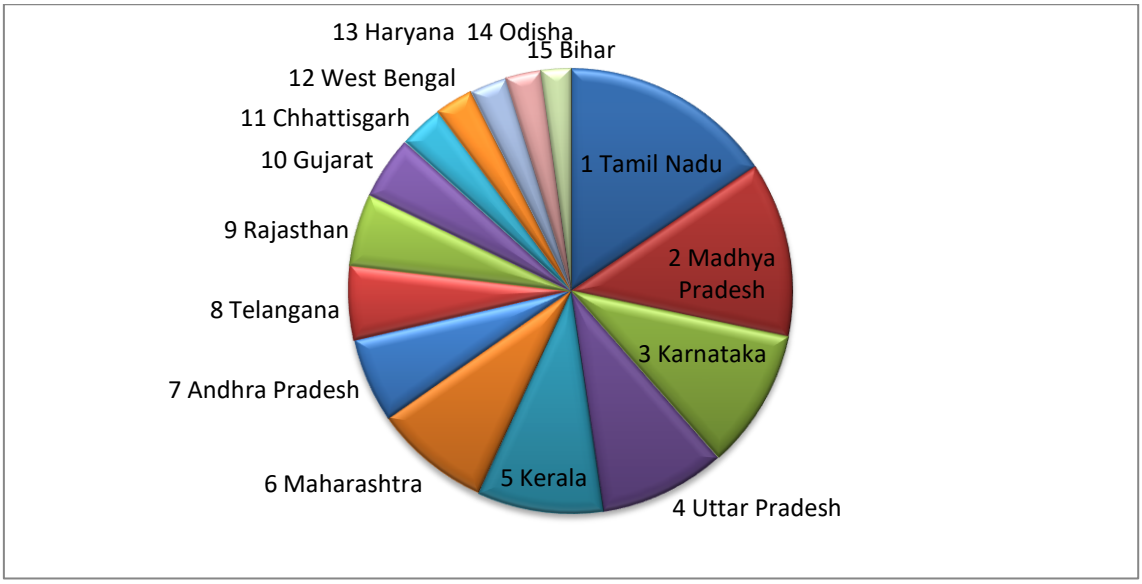


**FIGURE 1: NUMBER OF ROAD ACCIDENTS IN TOP 15 STATES & RESPECTIVE SHARES IN TOTAL ACCIDENTS IN 2019**

This is the project to give a solution to the problem of reducing the effort of the driver if any vehicle. In this project we combined the concept of wireless cars, voice recognition and created a voice controlled car. In this way we give a solution to the problem which is not the only solution to this problem but an effective way where it gives us the case of a passenger guiding the driver in cab or a vehicle to his location. The working of the module mainly depends upon a Bluetooth chip which is connected to the NI MyRIO which provides the input voice as text using the mobile application by name "Arduino Voice Control", which use Google Speech recognizing service. With the help of the Bluetooth module we get our information and try to control the operations of the car. We are trying to achieve this with the help of a MyRIO, LabVIEW and smart phone thus making it more users friendly.

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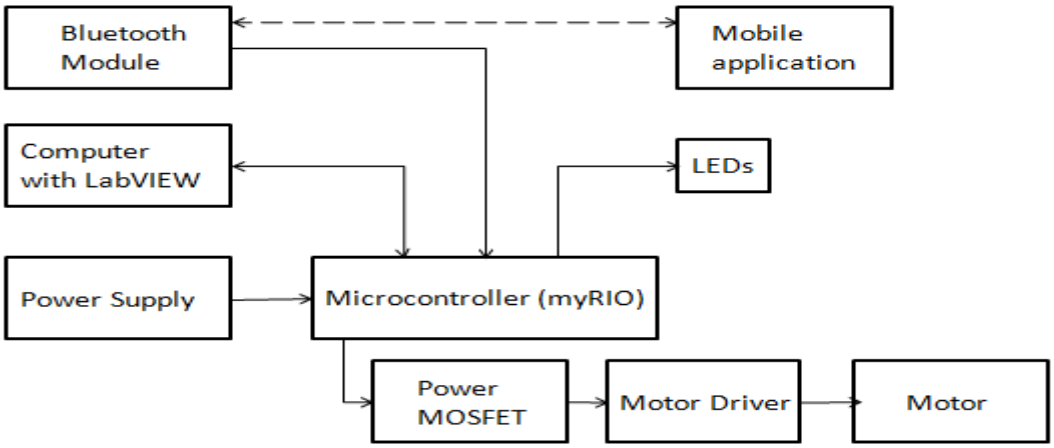


**FIGURE 3: BLOCK DIAGRAM OF THE SPEECH RECOGNISING CAR USING LabVIEW**

Here the project is connected to the smart phone through the mobile application, Arduino voice control, which converts the voice input into text by using a Google service application, Google Speech-to-Text service, which converts the voice to text provided the Network connection is available. Through this mobile application the converted text can be sent through Bluetooth communication to the myRIO which is attached with a Bluetooth Module. Based upon the input to myRIO from the Bluetooth module the respective response is given by the myRIO to the hardware of the project. The on board LED in the myRIO is used to indicate the status of the door. The digital out is used for speed and direction control of the motor using Power MOSFET (TIP120G) and Motor driver (LM293D).

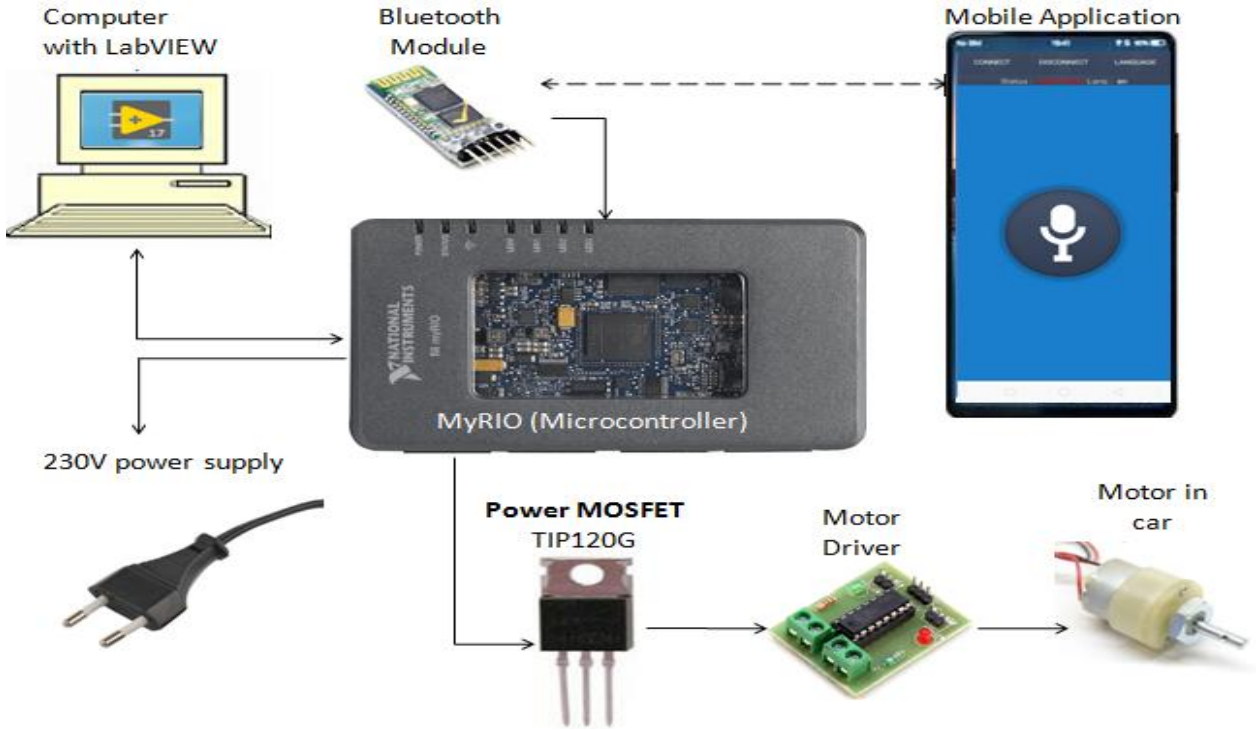


**FIGURE 4: SCHEMATIC DIAGRAM OF SPEECH RECOGNISING CAR USING LabVIEW**

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The Bluetooth module HC-05 as shown in fig.4 is a MASTER/SLAVE module. By default, the factory setting is SLAVE. The Role of the module (Master or Slave) is often configured only by AT COMMANDS. The slave modules cannot initiate a connection to a different Bluetooth device, but can accept connections. Master module can initiate a connection to other devices. The user can use it simply for a interface replacement to determine connection between MCU and GPS, PC to your embedded project, etc.
Hardware Features are, typical -80dBm sensitivity, up to +4dBm RF transmit power, 3.3 to 5 V I/O, PIO (Programmable Input/output) control, UART interface with programmable baud rate, with integrated antenna, with an edge connector.

Google Text-to-Speech as shown in fig.4 may be a screen reader application developed by Google for its Android OS. It powers applications to read aloud (speak) the text on the screen with support for several languages. Text-to-Speech could also be employed by apps like Google Play Books for reading books aloud, by Google Translate for reading aloud translations providing useful insight to the pronunciation of words, by Google Talkback and other spoken feedback accessibility-based applications, also as by third-party apps. Users must install voice data.

Arduino Voice control as in fig.4 is a mobile application which uses the Google Text-to-Speech service to convert the input voice into a text. The voices will be stored in your G-Drive and will be converted and then the text is transmitted to the NI MyRIO through Bluetooth module.
Pulse Width Modulation (PWM) as shown in fig.4, or pulse-duration modulation (PDM), may be a method of reducing the typical power delivered by an electrical signal, by effectively chopping it up into discrete parts. Duty cycle is changed according to the speed of the vehicle displayed in the program and then it will be given to MyRIO according to that, speed of the vehicle is adjusted.
LM293D motor driver board as shown in fig.4 allows control up to two 12V DC motors individually. Each motor are often driven at a maximum of 750mA offering an honest driving current for the motors. It supports both clock-wise and anti-clockwise rotation and speed control. It can easily be interfaced with a microcontroller such as 8051or with any DAQ.
A DC motor as shown in fig.4 is any of a category of electrical machines that converts DC electric power into a mechanical rotation.
Some of the advantages are like using myRIO gives the ease to interface, simple working and command conditions, it reduces the maximum accident rate, it makes our journey safe, using the Bluetooth module and mobile application makes the voice command simpler.
The application for this project is mainly used for all 4 wheeled vehicles on road which are prone to accidents.

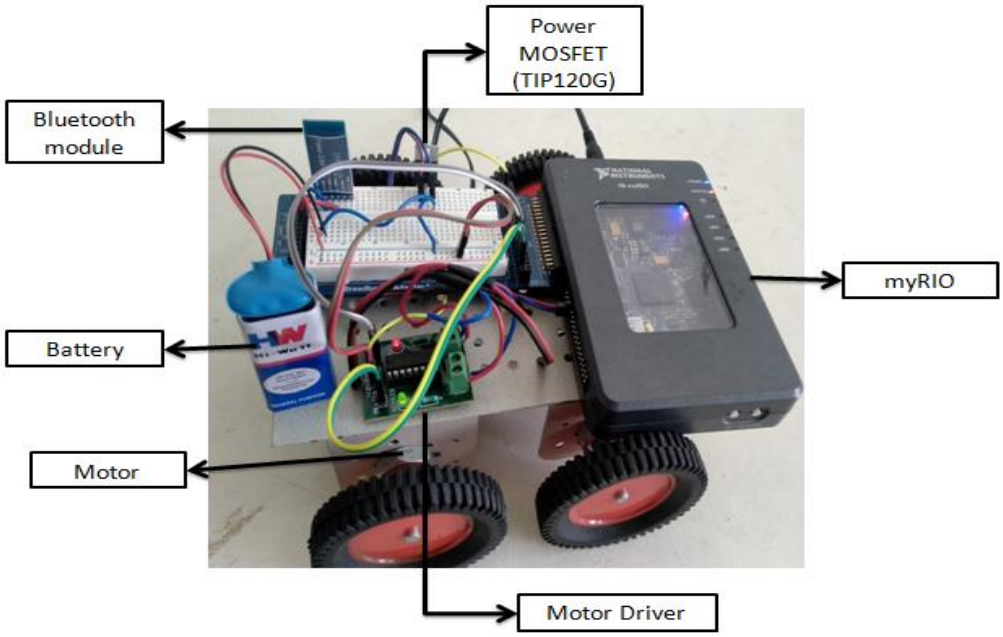


**FIGURE 2: SPEECH RECOGNISING CAR USING LabVIEW**

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## VII. RESULTS AND DISCUSSION

The prototype as shown within the figure above accepts the subsequent voice commands, supported which the various directions of motions possible within the DC motor are:

- **Door Close:** The 4 LEDs on the myRIO are going to be ON to point the doors are close.
- **Door Open:** The 4 LEDs on the myRIO are going to be OFF to point the doors are open
- **Reverse:** Both the motors within the reverse direction.
- **Turn Left:** Left motor in backward direction/Right motor within the forward direction.
- **Turn Right:** Right motor in backward direction/Left motor within the forward direction.
- **Speed 20:** All the motors within the forward direction and rotates at the speed of 50 rpm.
- **Speed 40:** All the motors within the forward direction and rotates at the speed of 100 rpm.
- **Speed 60:** All the motors within the forward direction and rotates at the speed of 150 rpm.
- **Speed 80:** All the motors within the forward direction and rotates at the speed of 200 rpm.
- **Speed 100:** All the motors within the forward direction and rotates at the speed of 250 rpm.
- **Speed 120:** All the motors within the forward direction and rotates at the speed of 300 rpm.
- **Stop:** All the motors are stopped.

## VIII. CONCLUSION

We conclude that this project will reduce the stress of the driver of the vehicle so that the accidents occurring due to the errors of the drivers can be reduced and at the same time controlling the vehicle using commands unlike complete control using an AI.

Adding additional voice recognition module to detect noises during a vehicle crash like noise when airbags are deployed will drastically increase the reliability of the system.

This system requires an external power supply, implementation of self - powered system using renewable energy like Wind and Solar will make the system more effective and efficient.

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