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Automatic Vehicle Turn Indicator using Speech Recognition

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Abstract*-- Voice-controlled innovation is an energizing region of research that is utilized to help people in the mechanical control of manual frameworks. It is a part of human-communication that builds the advances in programmed discourse acknowledgment or ASR with the inventive advances of characteristic language handling or NLP. Wise frameworks, for example, Automatic Vehicle Signaling Systems, can likewise take into consideration adaptability in manual activities. In late investigations, analysts have investigated regular language control of manual tasks. In this paper we will research interfacing voice control activities with Arduino-based equipment stages that are utilized to structure the programmed sign highlights in a vehicle. The control system includes a voice recognition circuit for activating turn signal devices within the vehicle. The voice recognition circuit takes in input from the voice from the Google maps voice assistant. In some formats, a wireless hardware is provided while in other embodiments original equipment manufacture is accommodated.

Keywords: Vehicle, Indicator, Automatic

I. INTRODUCTION

Human-machine interface dependent on voice acknowledgment is standing out to for the most part to eliminate issues in helping the driver to perform various tasks. Voice acknowledgment framework uses chosen verbally expressed words as the information, this information enables the machine to distinguish explicit words and in this way procedure the specific order and execute it. This strategy encourages the clients to play out the tasks all the more effectively and evacuates the piece of people to physically work the framework. A few applications as of now use voice control to perform different undertakings. For instance, voice-controlled automated arms are utilized in the restorative field to perform little medical procedures. Voice controlled robots have additionally been investigated in different zones, for example, intelligent wheelchairs, educational learning systems, social insurance systems, and individual correspondences and so on. For the most part, voice acknowledgment frameworks are found to have an expanded inability to procure rate because of the utilization of human voice, which is exceptionally manipulative and erroneous.

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The utilization of voice acknowledgment framework does not exclusively need voice source yet in addition ready to be utilized for autonomous voice source, for example, Google Voice Assistant can be used to control the turn indicators in vehicles. Current commercial signaling system uses a mechanical turn switch in the form of moving the switch in required direction to switch on the turn indicator.

The utilization of the voice for playing out the activity is progressively getting to be well known because of certain reasons, for example, totally evacuating manual contact. In this way, the capacity to get to the system will consistently be installed inside the framework itself, any place they go, expanding the effectiveness and well being of the user. The focal point of this paper is from the start to build up the voice acknowledgment framework to play out the order through methods for hands free activity of a direction and control framework that empowers the driver to get to the element moving and in a genuine driving condition, for example, the entrance of turn indicators in a vehicle.

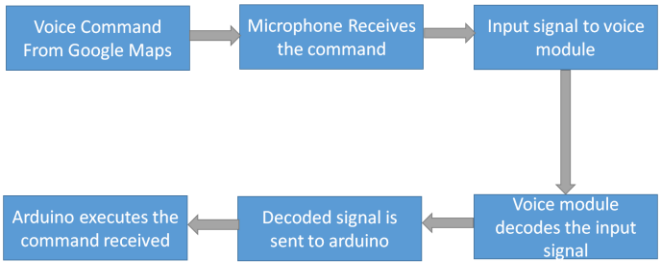

Fig. 1 Flow of process

II. PROBLEM STATEMENT

One of the problems with many drivers in today's society is the lack of signalling before making turns or changing lanes. In many instances it has been found that drivers, particularly less experienced drivers, often neglect the utilization of turn signal apparatus on their vehicle. Also, it has been found that there is a tendency on the part of many drivers, again particularly less experienced drivers, to be temporarily distracted from observing the road and areas surrounding the vehicle as they drive when access to a turn signal is sought. Even experienced drivers often involuntarily take their eyes off of the road to glance down at turn signal controls during activation of a turn signal. As a result, even the best of vehicle turn signal apparatus available in the marketplace is subject to limitations and is by no means an ideal apparatus. Our control system is operable within a host vehicle to control the operation of signalling apparatus indicative of a driver intent to execute a right turn or left turn.

III. EXISTING SYSTEM

The conventional turn indicator present in most of the vehicles is a fully manual controlled system. The system requires the driver to move the turn switch in accordance to the direction of the required turn (upwards for a left turn and downwards for a right turn).

This system sometimes might delay the indication of a driver to activate the turn signal. Most drivers do not activate the turn signal because there is a necessity to remove their hands from the steering wheel to switch on the indicator. For less experienced drivers, this method is even more difficult.

Fig. 1 Turn Signal Switch

The wiring of a conventional turn indicator is made as follows. At the point when no blinker is chosen, both brake lights will get control when the brake pedal is pushed. At the point when the left blinker is chosen, the brake light for the left side is crippled by the blinker switch, and the bulb presently gets control from the blaze unit. Simultaneously, no change has been made to the correct side brake light. The outcome: left light glimmering, right light unfaltering with brakes on. Right light is out when brakes are off. Presently, changing to the correct side, the switch turns out to be valid: the correct side brake light is crippled, and capacity to the light is currently given by the blaze unit.

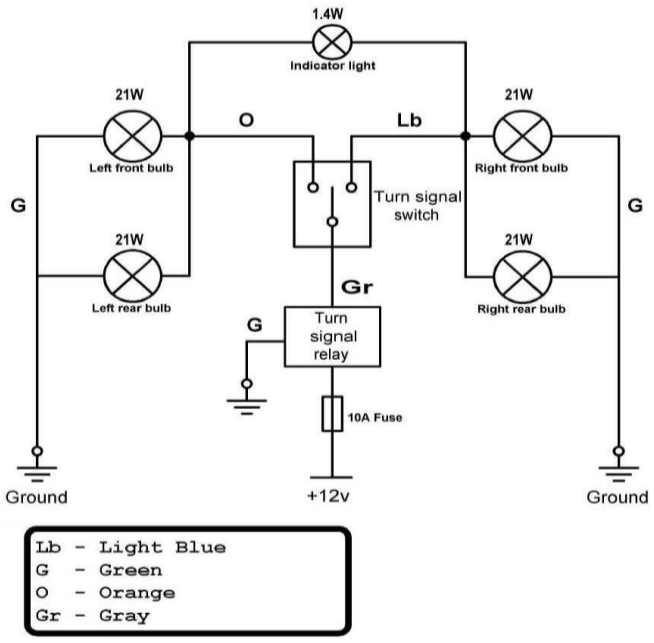

Fig. 3 Wiring of conventional indicator in Honda Cars

A. ORVM

ORVM stands for Outside Rear View Mirror. Indicators placed on the rear view mirror make sure that, even if a vehicle is travelling parallel to the car and has crossed the conventional indicator placed on the back, the driver can easily identify the indication and react accordingly. It is also very ideal for a U-Turn, since these indicators are easily visible from a perpendicular view.

Fig. 4 ORVM Indicator

IV. PROPOSED SYSTEM

The proposed system intends to accomplish automation of vehicle signaling system, and totally evacuate the manual control of the turn switch indicator. The framework fundamentally comprises of three principle segments, an amplifier, for account the contribution from the Google voice right hand, voice recognition module compatible with the Arduino and an Arduino itself. An microphone regularly utilized in the PC framework is utilized as a voice sensor to record the assistant's voice. The recorded voice is handled in the voice module which will separate the directions for left and right turns. The perceived word is then utilized as contribution to the Arduino which will thus actuate the required indicator which is available in the vehicle. The block diagram of the entire system is shown in fig.

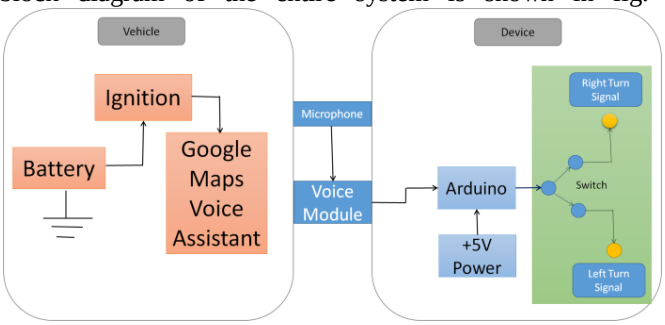

Fig. 5 Proposed System Architecture

A. Circuit diagram

The Arduino is given a contribution of +7V ~ +12V. The ground of the Arduino is associated with the ground of the voice module. The voice module is given a +5V contribution from the Arduino. The recipient (Rx) of the Arduino is associated with the transmitter (Tx) of the voice module. Additionally, the transmitter of the Arduino is associated with the receiver of the voice module.

The left pointer is associated with the 10 and 11 pins and the correct marker is associated with 5 and 6 pins. Every one of the associations are made utilizing male to female jumper links. The external microphone can be supplanted with a little and progressively powerful receiver uniquely intended for the Arduino.

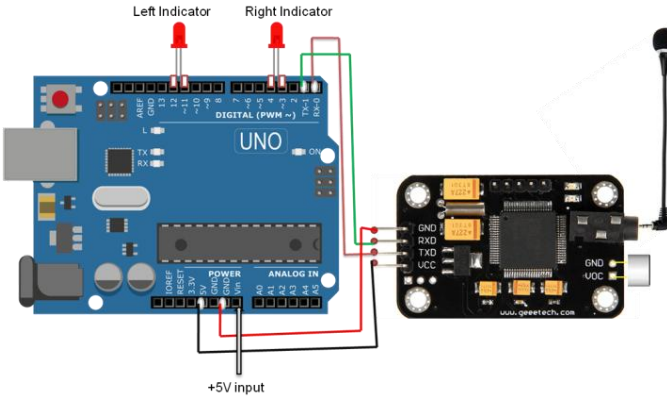

Fig. 6 Circuit Diagram

A. Voice Module

The voice recognition module is extremely little and effective. It can put away to 15 bits of individual voice guidelines. Those 15 pieces are partitioned into 3 groups, with 5 of every one group. The voice module must be combined at first to the Access Port programming utilizing the USB CP2012 – UART Module. The associations are shown in fig. When it is associated effectively, the module can be arranged by sending the directions through sequential port. The default band rate for the voice module is 9600 yet can be changed whenever required. The sequential information group: 8 information bits, no equality, 1 stop bit. The voice directions for Group 1 are recorded utilizing the 0x11 hex order individually until 5 individual voices are acknowledged. Essentially, the voices for gathering 2 and gathering 3 are prepared utilizing 0x12 and 0x13 individually. The voices in Group 1 are imported to the arduino utilizing sequential direction before it can perceive the 5 voice guidelines inside that gathering. This module is speaker free consequently it may not distinguish the guidance, whenever spoken by a human or if some other gadget is utilized. The outer amplifier can likewise be supplanted with a little and progressively viable mic that can be associated with the GND and VOC present in the voice module.

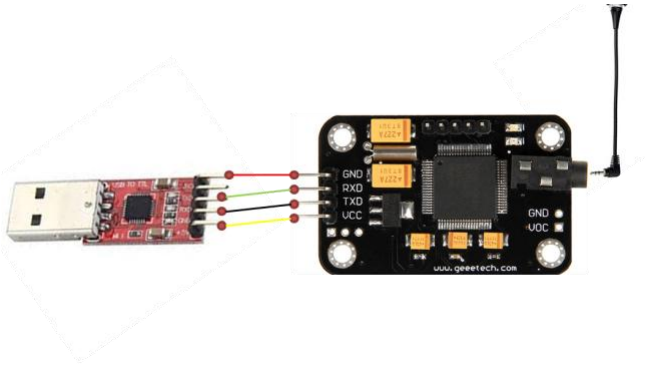

Fig. 7 USB CP2012 – UART Module

V. EXPERIMENTAL RESULTS

The efficiency of the proposed system has been calculated by implementing the same on a Remote Controlled Car and the observations have been recorded. The images of the implemented circuit and the raw signals of the commands have been attached.

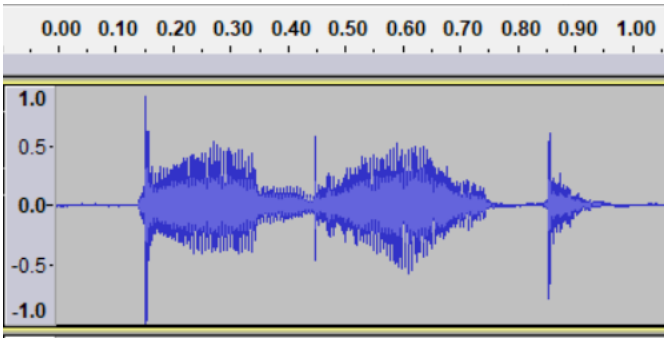

Fig. 8 Raw Signal – "Turn Right"

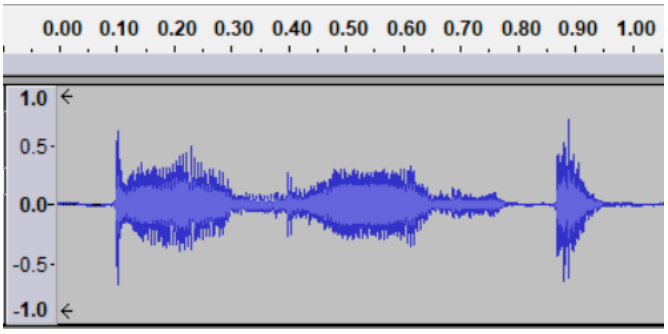

Fig. 9 Raw Signal – "Turn Left"

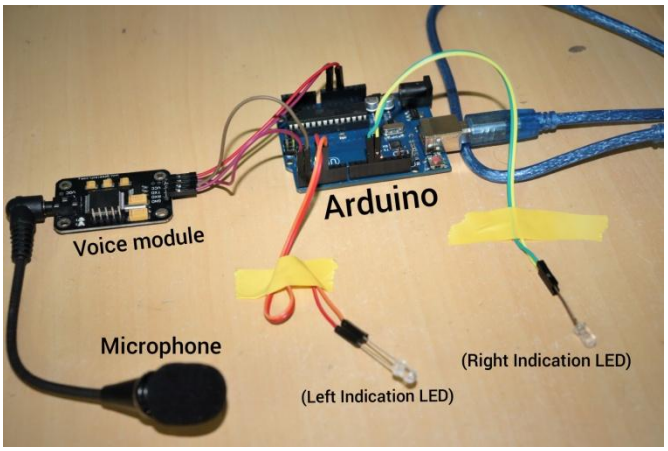

Fig. 10 Designed Prototype Validation

VI. CONCLUSION

This research has documented the disadvantages of the existing vehicle signaling system and has proposed a new and automated process for the indication of turn signals. The results have shown that the proposed system is an efficient system and completely restricts manual intervention when a turn indication is required. The work has also talked about

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