Speech Recognition for Robotic Vehicle Control

Anand Pawar [1], Likhith KR [2], Mallikarjun M [3], Pratheeka M [4], Zuhaib baig[5]
[1,2,3,4] *Department of Electrical and Electronics Engineering, Vidya Vikas Institute of Engineering and Technology, Mysuru*
[5]*Guide, Professor, Department of Electrical and Electronics Engineering, Vidya Vikas Institute of Engineering and Technology, Mysuru*

Abstract- **The term "robot" for the most part implies some (human-like) appearance exploration instituted some examination issues for creating humanoid robot and one of the noteworthy examination issues is to create machine that have human-like discernment. How is human observation? - The five established human sensors - vision, hearing, touch, smell and taste; by which they percept the encompassing scene. The fundamental objective of our undertaking is to present "hearing" sensor furthermore the discourse union to the Mobile robot such that it is competent to connect with human through Spoken Natural Language (NL). Discourse acknowledgment (SR) is a noticeable innovation, which helps us to present "hearing" and Natural Language (NL) interface through Speech for the Human-Robot communication. So the guarantee of human robot is beginning to wind up a reality. We have picked Mobile Robot, since this kind of robot is getting prominent as an administration robot in the social setting, where the fundamental test is to interface with human.**

Two sort of methodology have been decided for Voice User Interface (VUI) execution - utilizing a Hardware SR framework and another, utilizing a Software SR framework. We have taken after Hybrid engineering for the general apply autonomy outline and correspondence with the SR framework; likewise made the punctuation for the discourse, which is decided for the automated exercises in his field. The configuration and both usage methodologies are exhibited in this report.

One of the vital objectives of our task is to present appropriate UI for tenderfoot client and our test arrangement is planned by our undertaking objectives; so we have likewise directed an ease of use assessment of our framework through learner clients. We have performed tests with straightforward and complex sentences for various sorts of apply autonomy exercises; furthermore broke down the test result to discover the issues and confinements. This report exhibits all the test outcomes and the discoveries, which we have accomplished all through the venture.

I.INTRODUCTION

This project reports a couple of outcome of progressing research extend that means to investigate approaches to command a modern robot utilizing the human voice with territorial dialect. These elements can enthusiasm with a few modern, research facility and clean-room applications, where a nearby participation among robots and people is alluring. Apply autonomy Is the branch of mechanical building, electrical designing and software engineering that arrangements with the configuration, development, operation, and use of robots, and also PC frameworks for their control, tactile criticism, and data preparing. These advances manage robotized machines that can replace people in unsafe situations or assembling forms, or take after people in appearance, conduct, and/or insight. A hefty portion of today's robots are motivated by nature adding to the field of apply autonomy.

The idea of making machines that can work self-sufficiently goes back to traditional times, however scrutinize into the usefulness and potential employments of robots did not become generously until the twentieth century. All through history, apply autonomy has been regularly seen to copy human conduct, and frequently oversee assignments in a comparative design. Today, mechanical autonomy is a quickly developing field, as innovative advances keep; inquiring about, outlining, and building new robots fill different functional needs, whether locally, monetarily, or militarily. Numerous robots do tasks that are unsafe to individuals, for example, defusing bombs, mines and investigating wrecks.

II. LITERATURE SURVEY

1. It is conceivable to appraise the commotion by utilizing data on the robot's own particular movements and stances, in light of the fact that a sort of movement and signal creates just about the same example of clamor without fail. In this paper, it is portrayed as voice acknowledgment control framework for robot (VRCS) framework which can vigorously perceive voice by grown-ups and youngsters in uproarious situations. . It is assessed that the VRCS framework in a correspondence robot put in a genuine loud environment. Voice is caught utilizing a remote receiver. To stifle obstruction and commotion and to weaken resonation, this paper actualized a multichannel framework comprising of an exception vigorous summed up side-projection canceller strategy and a component space clamor concealment utilizing MMSE criteria. Voice movement periods are identified utilizing GMM-based end-point recognition

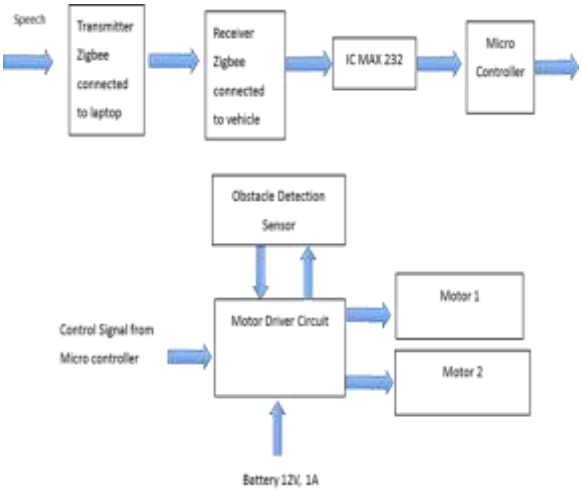
2. Individual automated assistants help decreasing the manual endeavors being put by people in their everyday errands. This paper executes a voice-controlled individual colleague robot. The human voice charges are given to the automated aide remotely, by utilizing a savvy cell telephone. The robot can perform distinctive developments, turns, begin/stop operations and move an item starting with one place then onto the next. The voice orders are handled continuously, utilizing an online cloud server. The discourse signal charges changed over to content structure are conveyed to the robot over a Bluetooth system. The individual associate robot is created on a small scale controller based stage and can know about its present area.

III. OBJECTIVES

- Recognizing Multi speech language commands.
- Wireless automating robot over the range of 10 to 30meters.
- Robotic frame work for human and robotic module interaction.
- Addition frame work Button events to control the action of robot

IV. PROPOSED METHODOLOGY

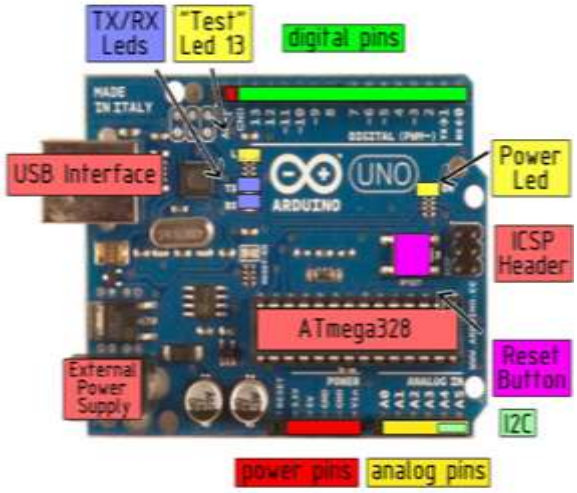
- In this project a user interface windows form designed for speech recognition which can handle regional speech and control a system.
- In order to control robotic vehicle PAN network is used .This network device provide a communication channel between the user pc and Embedded device so that the speech recognized by the PC is fed to user interface from which it is designed using .NET
- After that the speech is get processed for user convenient regional language then processed speech is covert text with the help of system speech synthesizer



V. HARDWARE DESCRIPTION OF THE PROJECT

- ATMEGA328 microcontroller
- Motor Driver L293D
- CC2500 x-bee
- 12 volt 1.2Ah battery
- Dc motor

Hardware Requirments Arduino UNO



The Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.. You can tinker with your UNO without worrying too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.

"Uno" means one in Italian and was chosen to mark the release of Arduino Software (IDE) 1.0. The Uno board and version 1.0 of Arduino Software (IDE) were the reference versions of Arduino, now evolved to newer releases. The Uno board is the first in a series of USB Arduino boards, and the reference model for the Arduino platform; for an extensive list of current, past or outdated boards see the Arduino index of boards.

You can find here your board warranty information.

Gear Dc Motor

At whatever point a mechanical autonomy specialist discuss making a robot, the primary thing rings a bell is making the robot precede onward the ground. What's more, there are constantly two choices before the architect need to utilize a DC or stepper motor. With regards to speed, weight, size, cost. DC motors are constantly favored over stepper motor. There are numerous things which can be done when dc motors are connected with microcontroller. For instance rate of motor can be controlled and control the heading of revolution, can likewise do encoding of the turn made by DC motor i.e. monitoring what numbers revolution are made by motor

CC2500 Xbee Description:

CC2500 Transceiver work on ISM band (2. 4 ghz) reserved internationally that do not require any license. These Wireless RF CC2500 Transceiver also support multiple frequencies within same band rate that helps in avoiding data collision with no requirement of complex wireless connection software for connecting to serial devices. Further, these wireless CC2500 Transreceiver do not require external antenna and work on 5-9v DC supply with standard uart interface. Suitable for transmitting and receiving data at multiple baud rates, the module is direct line in replacement for serial communication and finds applications for wireless sensor network, wireless device control, wireless data transfer, wireless energy metering, robotics, wireless data logger and others.

VI. SOFTWARE DESCRIPTION OF THE PROJECT

The software requirements for designing of multi-language robot is as follows

- Microsoft visual studio 2010.net
- Arduino IDE

MICROSOFT VISUAL STUDIO 2010.NET:

C# is a dialect of Microsoft visual studio that allows the developers to create specific application which includes both graphical and code end which can be connected to database.

C# runs only on windows machine by using C# developers can create windows based client

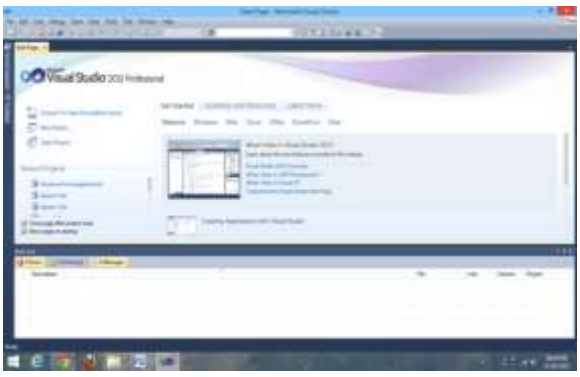
application, data base integration Xml for web related services and many more features are included by using visual studio frame work user can compile, debug and build the application in this project c# application is used at receiver side were corresponding person accesses to the data base of the patient to view the recorded log of the status.

.NET SYSTEM STAGE DESIGN

C# will be executed repeatedly on .NET Structure, is vital piece of operating system which consolidates a backend execution system called the typical thread runtime which have inbuilt libraries which is accessed by class. An overall mark is the reason which makes execution and headway circumstances in which code and inbuilt add on participate reliably. Coding done in C# is aggregated and transitional lingo that changes with the CLI point of interest. The inline code and sources, for instance, bitmaps and strings, are secured to a plate in an exe record assembled a get, normally with a development of .exe or .dll. Parties contain and demonstrate that gives information about the party's sorts, interpretation, society, and security essentials.

Exactly when the C# framework is executed, the social gathering is stacked into the CLR, and which may take distinctive exercises in perspective of the details in appear. By then, security necessities must be fulfilled, CLR done at the last possible second (JIT) get-together to change over the IL code to neighborhood machine rules. The CLR moreover gives distinctive organizations related to customize waste social occasion, unique case dealing with, and resource organization. Code that is executed by the CLR is as a less than dependable rule suggested as "directed code," instead of "unmanaged code" that can be accumulated to neighborhood machine.

Microsoft Visual Studio 2010.NET:



C# is an elegant and type-safe object-oriented language that enables developers to build a variety of secure and robust applications that run on the .NET Framework. You can use C# to create traditional Windows client applications, XML Web services, distributed components, client-server applications, database applications, and much, much more. Visual C# provides an advanced code editor, convenient user interface designers, integrated debugger, and many other tools to make it easier to develop applications based on version 4.0 of the C# language and version 4.0 of the .NET Framework

VII. ADVANTAGES

- This system is compact and flexible so that it can travel over a dense area.
- Robot vehicle can be controlled either by button events or by speech events.
- Provide more convenience for user in case of language of communication and can be controlled from long distance.
- It can be controlled over 10-100 meters of distance from the transmitting end.
- This project provides a best GUI (graphical user interface) developed with platforms of visual studio.net 2010 with back end coding with C#.

VIII. DISADVANTAGES

- Since we are using a low cost zigbee so it can be controlled over 30 meters
- The system is not too flexible in the case of battery life of robotic vehicle

IX. CONCLUSION AND FUTURE SCOPE:

Conclusion:

This framework pays to the self-reliance. This decreases the manual exertion for an achieving and recognizing the order for controlling the movement of a robot by determined charges. Further that, the improvement of this model is finished with less cost and reasonable. This robot can be utilized to do remote surveillance. We are actualizing programmed robot it has different preferences. We can likewise include new innovation in this robot.

This system can be made highly efficient and effective. The setup for maintaining the robot will be

a onetime investment for any real life application. The motor drive and control arrangement of the model astute robot has been exhibited. The microcontroller based voice worked keen robot will bring more comfort in hazard environment surveillance, also the robot has function of rotating wheel by some defined angle that will be very useful for the user for taking left or right turn

Future scope of the project:

- The range of control could be increased by using long range wireless modules like Wi-Fi, etc.
- Android based control with RTP based video rendering can be done.

REFERENCES

[1] Stephen Cook, Speech Recognition HOWTO
[2] Fatih AYDINOĞLU, Robot Control System with Voice Command Recognition, Yıldız Technical University, Department of Computer Engineering
[3] P. M. Grant, Speech recognition techniques
[4] Sahar E. Bou-Ghazale, Member, IEEE, and John H. L. Hansen, Senior Member, IEEE, A Comparative Study of Traditional and Newly Proposed Features for Recognition of Speech Under Stress
[5] M. Chetouani, B. Gas, J.L. Zarader, C. Chavy, Neural Predictive Coding for Speech Discriminate Feature Extraction : The DFE-NPC, Laboratories des Instruments et Systems d'Ile de France
[6] Raymond Low and Roberto Togneri, Speech Recognition Using the Probabilistic Neural Network, The University of Western Australia, Department of Electrical and Electronic Engineering
[7] M. M. El Choubassi, H. E. El Khoury, C. E. Jabra Alagha, J. A. Skaf and M. A. AlAlaoui, Arabic Speech Recognition Using Recurrent Neural Networks, Faculty of Engineering and Architecture – American University of Beirut