

INTELLIGENT SPEECH RECOGNITION AND VOICE OPERATED ROBOT WITH WIRELESS VOICE & VIDEO TRANSMISSION TO REMOTE TELEVISION

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Abstract: Speech Recognition is a technology which allows the processing of a speech input to text and is speaker independent. This allows it to be used in numerous applications ranging from digital assistants to controlling machinery. This paper proposes a strategy which can be used in controlling a robotic vehicle through connected speech input. The speech recognizer platform will be an Android smartphone which communicates with the robot using Bluetooth Connectivity. This method allows for efficient recognition and smooth data transfer. Additionally the robot will also have the capability to detect obstacles and inform the user to use a different command. Our proposed technique will be useful for applications such as assistive robots for people with disabilities or in industrial applications such as work robots

I. INTRODUCTION

This paper proposes a system whereby the human voice become a specific key to manipulate a robot, but nowhere a speech recognition module is used. In this system an android application is used to recognize human voice and is converted to text. This text is further processed and used to control robot. Keeping in mind the need of the day (requirements of the present day), our goal is to move towards making accessible to the manipulation of everyday objects to individuals with motor impairments. But voice (or speech) recognition module involves a high cost when it comes to practicality (reality). Using our system we perform several studies on control style variants for robots. Results show that it is indeed possible to learn to efficiently manipulate real world objects with only voice (human voice) as a control mechanism. Our results provide strong evidence that the further development of voice controlled robotics will be successful.

India is a growing, wealthy and powerful coal country. Even so, the prevailing hygienic mining operations growth rates are still low, rapidly in recent years, whenever a tragedy often occurs at the mining area leading to substantial property loss and life. The safety challenges in the coal mine are gradually being resolved by the nation and the people. Due to the complex nature of the mining ecosystem and the distinct workplace environment of mining operations, catastrophes which are occurring in the coal mine ought to be surveilled. Conventional surveillance systems in mining activities prefer to be wired networks which play a crucial role in safety risk management of mining operations. As mining sites continue to evolve and the intensity of resource extraction expands, there are several pavements

which become invisible, which are concealed. Furthermore, laying cables which are costly and time consuming is not convenient. We will design a safety monitoring system for coal mines based on a network of wireless sensor networks that improve production safety monitoring levels and reduce accidents in coal mines to tackle issues. There are plenty hectares of armed forces technologies and services. It encompasses weapons, weapon systems, tools and confidential data. In the event of an emergency, however, some mechanism based on modern electronics and innovative technologies is essential if military officers active in surveillance areas seem to be to inform that they can rapidly coordinate for protection to be stuck and enacted at geographical boundaries and antagonistic territories. For military applications like with the patrolling of the involved space, this mechanism is a lot of economical. In captive or in aggressive instances it'll provide inherent blessings. it would walk on virtually any surface and supply supervising over a locality. The supervising becomes a lot of economical with the assistance of contemporary live streaming, it detects extreme temps and conjointly uses water hydrant to scale back the fireplace. within the planned system, video quality is makeshift. This is often necessary in several applications like noncombatant robots and military robots.

II. LITERATURE REVIEW

The surprising raise in the utilizing of robots and automation offers various advantages as well as it has drawn the attention of both academic investigation and commercial programs. The analysis on numerous technique of controlling robot has accomplished quite a few success by introducing a number of innovative & unique methods of robot movement control. Verbal interaction intended for

robot controlling is actually sort of an innovative process among many methods which are introduced regarding robotics control. Previous works on voice controlled robots shows that the design of those robot were complicated and none of them were able to interact with users. Robots are anticipated to socialize along with its user however it has not yet arrived at this kind of level . There are numbers of techniques to control robot using voice identification yet it is reasonably limited .

Akshay Kumar [1].This project presents a modern approach to remote and boundaries surveillance using a multi-functional robot based on current IOT. This robot continuously watches and sends live streaming to an authorized person. Here, the MJPG streamer is used to visualize the live video installed in the raspberry pi. The VNC software is installed on the local computer and connects to the raspberry pi that must be installed on the remote computer. The server transmits a duplicate of the display screen. This process includes a smart surveillance robot for military application. With the guidance of this robot, we can assess the current state of the border area in real time without depending on any human source. The surveillance robot provides us with live Turkish Journal of Computer and Mathematics Education Vol.12 No.7 (2021), 784-794 785 Research Article streaming video in response to our commands. The goal of this project is to create an equipment circuit that allows people to control robots or other home machinery using their voices. Smart phones are becoming increasingly powerful devices with the ability to interact with other appliances via Bluetooth, wifi, and other means. Bluetooth, despite being a low-cost mode of communication, provides a strong mode of connection. H.I.Darwish[2].This project will use Google voice recognition to analyze human speech and transfer it to text using the Google voice to text API. The converted text will be sent to the microcontroller as a code using the HC05 Bluetooth. The HC-05 will act as a receiver (Rx) for this function, obtaining the code from the smart phone and forwarding it to the decode circuit.Via the UART protocol, a controller can communicate with the Bluetooth module. The aim of this project is to develop an equipment circuit that allows user to manage robots with their voices.The main part of the project to control the robot from any remote location is the creation of a web page. It will be necessary to construct a single platform from which we will access the robot. We can control the direction of the motor and the position of the camera from the web page, as well as monitor the video feed. It will be necessary to secure our website from anyone.

B.Mert[3]. In this paper, they develop a prototype of a smart robot whose movements are controlled by voicecommands and gesture-commands. Voice-command controls include an Android OS-based smart phone. Gesture-commands can be delivered either by hand using an accelerometer, or by tilt-getting using a smart phone's gravity sensor.Robot's body movements are controlled by the voice-commands, and its arms and claws are controlled by the gesture-commands.The robot's body will move backwards and forwards, left and right, and stop, on several things. The established robot's body movements are controlled by an Android OS-based smart-phone application called "AMR Voice."Using an online cloud server, this pre-developed Android application converts speech signal commands to text.

III. DESIGN OF HARDWARE

This chapter briefly explains about the Hardware implementation of authentication of Arduino based voice and video operated Bluetooth robot. It discuss the circuit diagram of each module in detail.

3.1.ARDUINO UNO

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, 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.

The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter. Uno board has a resistor pulling the 8U2 HWB line to ground, making it easier to put into DFU mode.Arduino board has the following new features:

- 1.0 pinout: added SDA and SCL pins that are near to the AREF pin and two other new pins placed near to the RESET pin, the IOREF that allow the shields to adapt to the voltage provided from the board. In future, shields will be compatible both with the board that use the AVR, which operate with 5V and with the Arduino Due that operate with 3.3V.

The second one is a not connected pin, that is reserved for future purposes.

- Stronger RESET circuit.
- Atmega 16U2 replace the 8U2.

"Uno" means one in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduino, moving forward. The Uno is the latest in a series of USB Arduino boards, and the reference model for the Arduino platform; for a comparison with previous versions, see the index of Arduino boards.



Fig: ARDUINO UNO

3.2. POWER SUPPLY

The power supplies are designed to convert high voltage AC mains electricity to a suitable low voltage supply for electronic circuits and other devices. A power supply can be broken down into a series of blocks, each of which performs a particular function. A d.c power supply which maintains the output voltage constant irrespective of a.c mains fluctuations or load variations is known as “Regulated D.C Power Supply”.

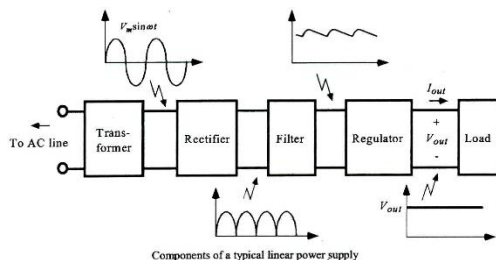


Fig:Power Supply

3.3 LCD

Liquid Crystal Display also called as LCD is very helpful in providing user interface as well as for debugging purpose. The most commonly used Character based LCDs are based on Hitachi's HD44780 controller or other which are compatible with HD44580. The most commonly used LCDs found in the market today are 1 Line, 2 Line or 4 Line LCDs which have only 1 controller and support at most of 80 characters, whereas LCDs supporting more than 80 characters make use of 2 HD44780 controllers



3.4IR SENSOR

Infrared is a energy radiation with a frequency below our eyes sensitivity, so we cannot see it Even that we can not "see" sound frequencies, we know that it exist, we can listen them. Even that we can not see or hear infrared, we can feel it at our skin temperature sensors. When you approach your hand to fire or warm element, you will "feel" the heat, but you can't see it. You can see the fire because it emits other types of radiation, visible to your eyes, but it also emits lots of infrared that you can only feel in your skin.

Infra-Red is interesting, because it is easily generated and doesn't suffer electromagnetic interference, so it is nicely used to communication and control, but it is not perfect, some other light emissions could contains infrared as well, and that can interfere in this communication. The sun is an example, since it emits a wide spectrum or radiation.

The adventure of using lots of infra-red in TV/VCR remote controls and other applications, brought infra-red diodes (emitter and receivers) at very low cost at the market.

From now on you should think as infrared as just a "red" light. This light can mean something to the receiver, the "on or off" radiation can transmit different meanings. Lots of things can generate infrared, anything that radiate heat do it, including out body, lamps, stove, oven, friction your hands together, even the hot water at the faucet.

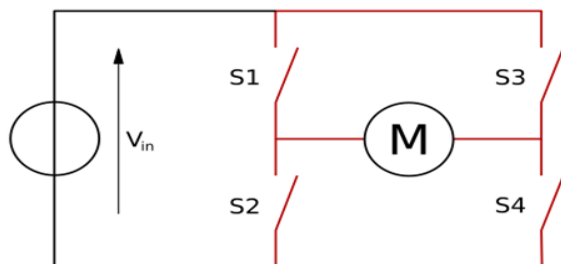
3.5 H-Bridge Driver with DC Motor

The speed of a DC motor is directly proportional to the supply voltage, so if we reduce the supply voltage from 12 Volts to 6 Volts, the motor will run at half the speed. How can this be achieved when the battery is fixed at 12 Volts? The speed controller works by varying the average voltage sent to the motor. It could do this by simply adjusting the voltage sent to the motor, but this is quite inefficient to do. A better way is to switch the motor's supply on and off very quickly. If the switching is fast enough, the motor doesn't notice it, it only notices the average effect.

When you watch a film in the cinema, or the television, what you are actually seeing is a series of fixed pictures, which change rapidly enough that your eyes just see the average effect - movement. Your brain fills in the gaps to give an average effect.

Now imagine a light bulb with a switch. When you close the switch, the bulb goes on and is at full brightness, say 100 Watts. When you open the switch it goes off (0 Watts). Now if you close the switch for a fraction of a second, then open it for the same amount of time, the filament won't have time to cool down and heat up, and you will just get an average glow of 50 Watts. This is how lamp dimmers work, and the same principle is used by speed controllers to drive a motor. When the switch is closed, the motor sees 12 Volts, and when it is open it sees 0 Volts. If the switch is open for the same amount of time as it is closed, the motor will see an average of 6 Volts, and will run more slowly accordingly. The graph below shows the speed of a motor that is being turned on and off

H-BRIDGE:



An H-bridge is an electronic circuit which

enables DC electric motors to be run forwards or backwards. These circuits are often used in robotics. H-bridges are available as integrated circuits, or can be built from discrete components.

3.6 BLUETOOTH MODULE

HC-05 module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. The HC-05 Bluetooth Module can be used in a Master or Slave configuration, making it a great solution for wireless communication. This serial port Bluetooth module is fully qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps Modulation with complete 2.4GHz radio transceiver and baseband. It uses CSR Blue core 04-External single chip Bluetooth system with CMOS technology and with AFH (Adaptive Frequency Hopping Feature).

Bluetooth is a wireless technology standard for exchanging data between fixed and mobile devices over short distances using short-wavelength UHF radio waves in the industrial, scientific and medical radio bands, from 2.400 to 2.485 GHz, and building personal area networks (PANs). It was originally conceived as a wireless alternative to RS-232 data cables.

Bluetooth is managed by the Bluetooth Special Interest Group (SIG), which has more than 30,000 member companies in the areas of telecommunication, computing, networking, and consumer electronics. The IEEE standardized Bluetooth as **IEEE 802.15.1**, but no longer maintains the standard. The Bluetooth SIG oversees development of the specification, manages the qualification program, and protects the trademarks.^[3] A manufacturer must meet Bluetooth SIG standards to market it as a Bluetooth device.^[4] A network of patents apply to the technology, which are licensed to individual qualifying devices.



A typical Bluetooth mobile phone headset

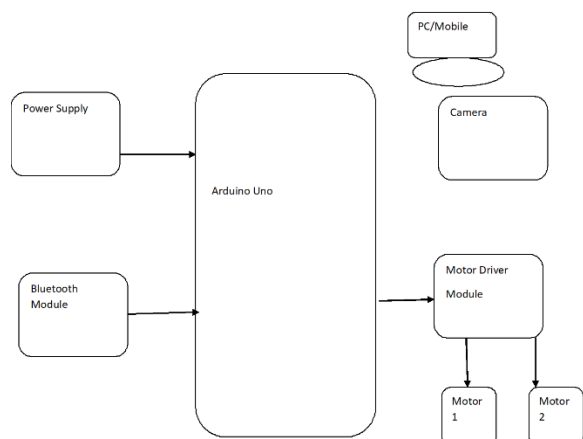


An internal notebook Bluetooth card (14×36×4 mm).

IV. PROJECT DESCRIPTION

This proposed work is design to Voice controlled Robot through Android application.

BLOCK DIAGRAM:



WORKING:

Voice controlled robot through an android application. Now here it is simple to control your robot using Bluetooth module HC-05 and AT89S52 microcontroller with your android Smartphone device. The controlling devices of the whole system is a microcontroller. The data receive by the Bluetooth module from android Smartphone is fed as input to the controller. The controller acts accordingly on the DC motor of the robot. The robot in the project can be moved in all the four directions using the android phone. The direction of the robot is displayed on the LCD display of the robot system. In achieving the task the controller is loaded with program written using embedded ‘C’

V.CONCLUSION

The objective of the paper is to realize the smart living, more specifically the home lighting system using the Bluetooth technology. Robot and smart phones are perfect match, especially mobile robots. As phones and mobile devices are each time powerful, using them as robot for building robot with

advanced features such as image processing. Android Bluetooth enable phones and Bluetooth module via HC-05 and communication among Bluetooth devices. It is concluded that smart living will gradually turn into reality that consumer can control their home remotely and wirelessly.

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