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Design and Fabrication of Talking Robot

Akshay Prakash J S, Sentahmizh Chittu D, Nandhini V, Abhishek N, Mr. G. Chandrasekar
Dhanalakshmi Srinivasan Engineering College (Autonomous), Perambalur, India

Abstract: *To make a robot talk we can go through two methods Speech Synthesis and Pre-recorded audio. Among them option a doesn't perform understandably well with Arduino. So, we are going for method Pre-recorded audio. Now we are creating a mini talking robot design and fabrication work. In feature we would like create some more innovative ideas in it. For that our first millstone is this talking robot. Not only are robots able to work with better accuracy, which reduces the amount of time and materials wasted, they can also work faster (and longer) than humans can. For many companies may would like to use talking robot. So that we are conduct to proceed this robot with less manufacturing cost and use many advance inventions in it. As the technology is growing immensely in recent years, certain improvisations need to be made. So, we are decided to make an artificial intelligence voice assistant taking robot. Speech technologies now days available on mobile devices show an increased performance both in terms of the language that they're able to capture and in terms of reliability. The availability of performant speech recognition engines suggests the deployment of vocal inter-faces also in consumer robots. In this paper, we report on our current work, by specifically focusing on the difficulties that arise in grounding the user's utterances in the environment where the robot is operating.*

Keywords: Robot

I. INTRODUCTION

A talking robot is a type of robot that is capable of producing speech or other vocalizations as a means of communication. These robots can be programmed to speak in a variety of languages and can be used in a wide range of applications, including customer service, language learning, and entertainment. They can be controlled by a computer program or by a human operator, and they often use natural language processing and other advanced technologies to understand and respond to human speech.

A talking robot is a type of robot that is capable of producing human-like speech through the use of text-to-speech (TTS) technology. This technology allows the robot to convert written text into spoken words, allowing it to communicate with people in a more natural and intuitive way. Talking robots are used in a wide range of applications, including customer service, education, and entertainment. They are also being developed for use in healthcare and other industries where human-like communication is important.

A talking robot is a type of robot that is capable of producing speech and communicating with humans using natural language. These robots can be programmed to understand and respond to a wide range of commands and questions, and they are often used in a variety of applications such as customer service, education, and entertainment. Some examples of talking robots include personal assistants like Amazon's Alexa and Google Home, as well as more advanced robots like Hanson Robotics' Sophia.

II. LITERATURE SURVEY

Talking with a robot in ENGLISH (March 2005)L Stephen Coles
Review: Future plans of a research project aimed at communicating in natural language with an intelligent automaton.

Building a talking baby robot, a contribution to the study of speech acquisition and evolution (November 2007) J. Serkhane, J.L. Schwartz, P. Bessière ICP, Grenoble Laplace-SHARP, Gravir, Grenoble
Review: A natural computational modelling framework is provided by cognitive robotics, or more precisely speech robotics, which is also based on embodiment, multimodality, development, and interaction.

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A Talking Robot and the Expressive Speech Communication with Human (December 2014) Hideyuki SAWADA
Review: This paper introduced a talking robot constructed mechanically with human-like vocal cords and a vocal tract. whose pitches and phonemes Were uniquely specified.

Smart talking robot Xiaotu: participatory library service based on artificial intelligence (April 2015)Fei Yao, Chengyu Zhang and Wu Chen
Review: This project by immersing it into the emerging mobile and social networking environments with the use of existing computer technologies and library resources, particularly focussing on providing a user-centred participatory service. The modularized architecture make Xiaotu conveniently share with other libraries, making it more acceptable by its counterparts.

Speech Planning of an Anthropomorphic Talking Robot for Consonant Sounds Production (May 2002) Kazufumi Nishikawa, Akihiro Imai, Takayuki Ogawara, Hideaki Takanobu, Takemi Mochida, AtsuoTakanishi
Review: We developed a talking robot WT-1R (Waseda Talker-No.1 Refined) that improved from WT-1 for the production of natural vowels and consonant sounds. We proposed the speech planning of WT-1R to reproduce the complicated phenomena of consonant sounds. For future works, we aim to completely produce the human voices.

Multilingual WikiTalk: Wikipedia-based talking robots that switch languages (August 2013) Graham Wilcock and Kristiina Jokinen
Review: Our talking robot demonstrated Wikipedia-based spoken information access in English. Our new demo shows a robot speaking different languages, getting content from different language Wikipedia's, and switching languages to meet the linguistic capabilities of different dialogue partners.

How Computers (Should) Talk to Humans (April 2006) Robert Porzel
Review: Research on dialogue systems in the past has by and large focused on engineering the various processing stages involved in dialogical human-computer interaction. That is not to say that natural language generation and synthesis have not made vast improvements, but rather that the nature and design of the computer as an interlocutor itself.

Artificial Intelligence-based Voice Assistant (October 2020)S Subhash,Prajwal N Srivatsa,S Siddesh,A Ullas,B Santhosh
Review: Voice control is a major growing feature that change the way people can live. The voice assistant is commonly being used in smartphones and laptops. AI based Voice assistants are the operating systems that can recognize human voice and respond via integrated voices.

VOICE ASSISTANT - A REVIEW (March 2021) Shabdali Suresh Shetty.
Review: In this article, they discussed a voice-activated personal assistant developed using Python. Voice-activated personal assistant developed using Python. The wizard is currently online and performs basic tasks such as updating the weather, streaming music, browsing Wikipedia, opening PC applications, and so on. The current system functions are limited to the network.

Alexa-Based Voice Assistant for Smart Home Applications (July 2021) Asuncion Santamaria,Guillermo del Campo,Edgar Saavedraand Clara Jimenez
Review: Today, the Internet of Things (IoT) is becoming an essential player in creating a new smart era. The communication through the Internet to IoT devices enables new applications in multiple environments, including smart buildings and cities. The IoT market is projected to grow to 75.4 billion connected devices by 2020.

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Obstacle avoidance with ultrasonic sensors (April 1988) J. Borenstein,Y. Koren
Review: A mobile robot system, capable of performing various tasks for the physically disabled, has been developed. To avoid collision with unexpected obstacles, the mobile robot uses ultrasonic range finders for detection and mapping. The obstacle avoidance strategy used for this robot is described. Since this strategy depends heavily on the performance of the ultrasonic range finders, these sensors and the effect of their limitations on the obstacle avoidance algorithm are discussed in detail.

Obstacle Detection using Ultrasonic Sensors (April 2016) Delicia Perlin Rebelo, Cecilia Jane D'Silva, Linford William Fernandes, Linford William Fernandes
Review: The above ultrasonic sensors were studied and the HCSR-04 ultrasonic sensor was selected, as the results are satisfying for its use in the automobile prototype system being developed. It was used for distance measurement of obstacles that appear or lie in the path of prototype. On successful implementation of distance measurement, the obstacle detection algorithm was successfully carried out too with minimal errors, by coding the algorithm in python.

Obstacle detection using ultrasonic sensor for a mobile robot (July 2019) Joseph Azeta, Christian Bolu, Daniel Hinviand Abiodun AAbioye
Review: Obstacle avoidance capability needs to be considered when designing mobile robots for different applications. The low-cost ultrasonic sensor for mobile robot is aim to design and implement a helpful tool that improves the ability of mobile robot to avoid obstacle successfully. A series of test were done to check the reliability of the system.
In our experiment the ultrasonic distance sensing element was accustomed to offer a large field of detection. Which can be implemented on mobile robots both remotely controlled and also on autonomous mode, once in the autonomous mode, the initial loading of the code needs no user intervention throughout its operation.
When it is placed in an unknown setting with obstacles, it runs while avoiding all obstacles with significant accuracy. Result demonstrated high accuracy of the ultrasonic sensor to avoid obstacle.

Performance comparison of Infrared and Ultrasonic sensors for obstacles of different materials in vehicle/ robot navigation applications (may 2016) Adarsh, Mohamed Kaleemuddin, Dinesh Bose, K I Ramachandran
Review: The vehicle model equipped with the distance measurement sensors provides a right platform for capturing the real-time data. The statistical analysis of the distance data (measured distance) from sensors with the actual distance will certainly help select the right sensor for the given type of obstacle.
Correlation value indicates the performance of ultrasonic sensors for a good set of obstacle types and infrared sensors to a specific type of material.
The low-cost sensors used for the analysis also helps the cost-effective development of better algorithms for addressing the navigational problems.

Obstacle Avoidance Robotic Vehicle Using Ultrasonic Sensor, Arduino Controller (February 2018) R. Vairavan, S. Ajith Kumar, L. Shabin Ashiff And C. Godwin Jose
Review: The above Arduino controller and ultrasonic sensor were studied and the HcSR04 ultrasonic sensor was selected, as the controlling result are satisfying for its use in the automobile prototype system bring developed. It was used to sense the obstacle and avoidance them.
On successful implementation of obstacle avoidance algorithm was successfully carried out too with minimal errors, by coding the algorithm in python.
Obstacle avoidance is a very good application to be used in vehicle preventing many accidents and loss of life.

Obstacle Avoiding Robot (January 2017) Faiza Tabassum, SusmitaLopa,Muhammad Masud Tarek
Review: Obstacle detection and avoidance can be considered as the central issue in designing mobile robots. This technology provides the robots with senses which it can use to traverse in unfamiliar environments without damaging itself. In this paper an Obstacle Avoiding Robot is designed which can detect obstacles in its path and manoeuvre around them without making any collision.

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Obstacle Detection and Object Size Measurement for Autonomous Mobile Robot using Sensor (March 2013) FayazShahdib, Md. Wali Ullah Bhuiyan, Md. Kamrul Hasan, Hasan Mahmud

Review: The error in length and width is the influence of several factors, the error in calculating the distance is a key factor, and also the distortion of the lens plays a key role in determining the size of the object. Some information about the object might have been lost when applying different image processing techniques. Regardless, the error percentage is small enough to be acceptable.

The future prospect of the project includes improving the accuracy of the system. We will use more efficient image processing techniques and algorithms to reduce the computational complexity and to detect and measure the size of an object more accurately. Different algorithms will allow us to work on colour image domain, we would be able detect, identify and track objects better.

Obstacle Avoidance Algorithm for Small Autonomous Mobile Robot Equipped with Ultrasonic Sensors (May 2020) Maryna Derkach, DanyloMatiuk, nnaSkargaBandurova

Review: Detection and avoiding obstacles in real time is an important design requirement for any autonomous mobile platforms. In this paper we propose a new algorithm for real time obstacle avoidance.

To improve the localization of a small autonomous mobile robot equipped with a microcontroller and four ultrasonic sensors, a linear recursive Kalman filter was used.

The application of the Kalman filter enables the robot to avoid additional obstacles when transferring data from the sensor, adaptively adjust the intensity of noise, which ensures a smoother movement of the robot.

Object recognition and obstacle avoidance robot(June 2009) Karthi Balasubramanian, R. Arunkumar, Jinu Jayachandran, Vishnu Jayapal, Bibin A. Chundattand Joshua D. Freeman

Review: Design highlights of a "Three-wheeled Autonomous Navigational Robot" are presented in this paper. An efficient modular architecture is proposed for ease of adding various modules to the robot.

Obstacle detection, pattern recognition and obstacle avoidance are the key aspects of the design. The robot has intelligence built into it that enables it to recognize and pick up balls of a particular colour and ignore other objects in its path. A single board computer mounted on the robot acts as the central controller.

It communicates with ultrasonic sensors and motors through multiple microcontrollers and controls the entire motion of the unit. As part of the robot design, a modified Hbridge circuit for driving DC motors efficiently is proposed in this paper.

III. EXISTING SYSTEM AND LIMITATIONS

3.1 Existing Model

There are several existing AI voice assistant robots on the market, including Amazon's Echo devices with Alexa, Google Home devices with Google Assistant, and Apple's Home Pod with Siri. These devices are designed to respond to voice commands and perform tasks such as playing music, setting reminders, and answering questions. Additionally, there are a number of other home automation devices that integrate with these voice assistants, such as smart thermostats and smart lights. There are also similar devices made by other manufacturers like Sonos, Harman Kardon, and JBL.

These robots are typically integrated into smart speakers or other devices and can be used to perform a variety of tasks such as playing music, setting reminders, and answering questions. Additionally, there are several companies that have developed standalone AI voice assistant robots for use in homes and offices, such as Jibo and Kuri.

Sofia robot is a humanoid robot developed by Hanson Robotics. It is an AI-powered robot that is capable of recognizing and responding to human emotions, and can be used for a variety of applications such as customer service, education, and entertainment. Sofia has a humanoid face with expressive features and is designed to be able to interact with humans in a natural and intuitive way. The robot can answer questions, carry on conversations, and even tell jokes. Sofia has been demonstrated in various events, trade shows, and research events and have been used to showcase the capabilities of Hanson's AI and Robotics technology.

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3.2 Limitation of Existing Models

There are several limitations of voice assistant robots, such as:

1. Limited understanding: Voice assistant robots may have trouble understanding certain accents, dialects or specific language nuances, which can make them less effective for certain users.
2. Limited knowledge: Voice assistant robots may not have access to all the information that a human would, which can limit their ability to provide accurate answers to certain questions.
3. Privacy concerns: There are concerns about the security and privacy of personal data that is collected by voice assistant robots, as well as the potential for misuse of that data.
4. Limited tasks: Voice assistant robots may not be able to complete all the tasks a human can, such as cooking, cleaning, or other physical tasks.
5. Internet connectivity: Voice assistant robots require internet connectivity to function which can be a limitation if the internet connection is poor or not available.
6. Dependency: Overreliance on voice assistants may cause a decrease in the ability to remember things, the ability to focus, or the ability to perform simple tasks.
7. Cost: Some of the advanced voice assistant robots can be expensive, which may make them less accessible for some consumers.

From all these limitations we mainly focused on the building cost of the robot. So that minimise our building cost of the robot

IV. PROPOSED SYSTEM

So that we proposed our new project called taking robot. A talking robot is a type of robot that is able to produce speech or spoken words as a means of communication. This can be achieved through a variety of methods, such as text-to-speech synthesis, pre-recorded speech, or a combination of both. Talking robots can be used in a variety of applications, such as customer service, language learning, and entertainment. And also,a talking robot is a machine that is capable of generating speech or speech-like sounds. This can be done through a variety of techniques, such as text-to-speech synthesis or pre-recorded speech. Talking robots can be used in a wide range of applications, including customer service, entertainment, and education.

There are several options for building a budget-friendly talking robot. One option is to use a Raspberry Pi, a small and affordable computer, as the brain of the robot. You can then connect a microphone and speaker to the Raspberry Pi and use open-source software such as the Python programming language and the Open Speech Platform to create a simple voice-controlled robot. Another option is to use a microcontroller such as an Arduino and a pre-built speech recognition module to control the robot's movements and responses to voice commands. The cost of materials and components will vary depending on the specific design, but both of these options can be relatively inexpensive compared to purchasing a commercially available talking robot.

So that we mainly focused on the budget of the robot. so minimise our robot expense and create a model for that this is our main aim of this project.

V. HARDWARE COMPONENTS

5.1. Rasberry Pi 4

Raspberry Pi is a series of small single-board computers (SBCs) developed in the United Kingdom by the Raspberry Pi Foundation in association with Broadcom. The Raspberry Pi project originally leaned towards the promotion of teaching basic computer science in schools and in developing countries. The original model became more popular than anticipated, selling outside its target market for uses such as robotics. It is widely used in many areas, such as for weather monitoring, because of its low cost, modularity, and open design. It is typically used by computer and electronic hobbyists, due to its adoption of the HDMI and USB standards.

5.1.1 Specification

- SoC: Broadcom BCM2711B0 quad-core A72 (ARMv8-A) 64-bit @
- 1.5GHz

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- Networking: 2.4 GHz and 5 GHz 802.11b/g/n/ac wireless LAN
- RAM: 1GB, 2GB, or 4GB LPDDR4 SDRAM
- Bluetooth: Bluetooth 5.0, Bluetooth Low Energy (BLE)
- GPIO: 40-pin GPIO header, populated
- Storage: microSD
- Dimensions: 88 mm × 58 mm × 19.5 mm, 46 g

FIG 5.1.1 RASBERRY PI 4

5.2 Arduino Uno

The ArduinoUno is an open-source microcontroller board based on the ATmega328P microcontroller and developed by Arduino.cc and initially released in 2010. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable.

5.2.1 Specification

- Microcontroller: Microchip ATmega328P
- Operating Voltage: 5 Volts
- Input Voltage: 7 to 20 Volts
- Digital I/O Pins: 14

Fig 5.2.1 ARDUINO UNO

5.3 L298N Motor Driver

This L298N Motor Driver Module is a high-power motor driver module for driving DC and Stepper Motors. This module consists of an L298 motor driver IC and a 78M05 5V regulator. L298N Module can control up to 4 DC motors, or 2 DC motors with directional and speed control. The L298N Motor Driver is a controller that uses an HBridge to easily control the direction and speed of up to 2 DC motors.

5.3.1 Specification

- Logical voltage: 5V
- Drive voltage: 5V-35V
- Logical current: 0-36Ma
- Drive current: 2A (max. single bridge)
- Max power: 25W

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- Motor Supply Voltage (Maximum): 46V
- Motor Supply Current (Maximum): 2A

Fig 5.3.1 L298N Motor Driver

5.4 Geared DC Motor

A geared DC Motor has a gear assembly attached to the motor. The speed of the motor is counted in terms of rotations of the shaft per minute and is termed as RPM. The gear assembly helps in increasing the torque and reducing the speed. These motors have a 3 mm threaded drill hole in the middle of the shaft thus making it simple to connect it to the wheels or any other mechanical assembly.

5.4.1 Specifications

- Torque: 2 kg-cm
- Operating Voltage: 12V DC
- Gearbox: Attached Metal(spur)Gearbox
- Shaft diameter: 6mm with internal hole
- No-load current = 60 mA (Max)
- Load current 300 mA (Max)

Fig 5.4.1 GEARED MOTOR

5.5 Servo Motor

A servo motor is a rotary actuator or linear actuator that allows for precise control of angular or linear position, velocity and acceleration. It consists a suitable motor coupled to a sensor for position feedback. Features include good torque. holding power, and faster updates.

5.5.1 Specifications

- Model: MG90S
- Operating voltage: 4.8V to 6V
- Recommended voltage: 5V
- Stall torque: 1.8 kg/cm (4.8V)
- Max stall torque: 2.2 kg/cm (6V)
- Gear type: Metal
- Rotation: 0°-180°

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Fig 5.5.1 SERVO MOTOR MG995

5.6 Ultrasonic Sensor

An ultrasonic sensor is a type of electronic equipment that emits ultrasonic sound waves and converts the reflected sound into an electrical signal to determine the distance of a target item. Ultrasonic waves travel quicker than audible sound (i.e., the sound that humans can hear). The transmitter, which generates sound using piezoelectric crystals and the receiver, which encounters the sound after it has travelled to and from the target, are the two primary components of ultrasonic sensors.

5.6.1 Specification

- The sensing range lies between 40 cm to 300 cm.
- The response time is between 50 milliseconds to 200 milliseconds.
- It operates within the voltage range of 20 VDC to 30 VDC
- Preciseness is ±5%
- Resolution is 1mm
- The voltage of sensor output is between 0 VDC – 10 VDC
- The target dimensions to measure maximum distance is 5 cm × 5 cm

Fig 5.6.1 Ultrasonic Sensor

5.7 Speaker

Speakers are used to connect to a computer to generate sound, which are one of the most common output devices. Some speakers are designed to connect with any kind of sound system, while some can be hooked up only with computers. With the computer speaker, the computer's sound card creates a signal that is used to produce sound. The primary objective of speakers is to offer audio output for the listener. The electromagnetic waves are converted into sound waves through the speaker as they are transducers. The devices, like an audio receiver or computer, give audio input to speakers, which may be in the form of analog or digital. The function of the analog speaker is simply to magnify the analog electromagnetic waves into sound waves.

5.7.1 Specification

- Output Power: 5W (2.5W x 2)
- Driver Size: 52mm (2.04") x 2
- Impedance: 3Ω
- Frequency response: 120Hz-15kHzS/N

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- Ratio: ≥60dBSeparation: ≥50Db
- Line input: 3.5mm jack

Fig 5.7.1 SPEAKER: Zebronics Pluto speaker

5.8 Mic

It captures audio by converting sound waves into an electrical signal, which may be a digital or analog signal. This process can be implemented by a computer or other digital audio devices. The first electronic microphone was based on a liquid mechanism, which used a diaphragm that was connected to a current- charged needle in a diluted sulfuric acid solution. It was not able to reproduce the intelligible speech.

5.8.1 Specification

- Plug and play
- High quality recording
- USB port to start using
- Fast and convenient

Fig 5.8.1 Mic

5.9 Battery

This battery pack is made up of the best quality tested ICR 18650 2500mAh 20C Lithium-Ion Batteries and BMS circuit. It is small in size and weight compared to NiCd. Ni-MH, and Lead Acid Batteries. With the inbuilt Charge protection circuit, the battery pack can be directly charged with the DC power Adapter, so need not use the specialized battery chargers and worry about overcharging. We build these battery packs in a diverse range to fulfil 7.4V to 14.8 V and differential capacities.

5.9.1 Specification

- Battery specification: 18650/11.1V/2600mAh
- Termination voltage: 8.25V
- Charging temperature: 10-45°C

Fig 5.9.1 BATTERY

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VI. WORKING

6.1 Circuit Diagram

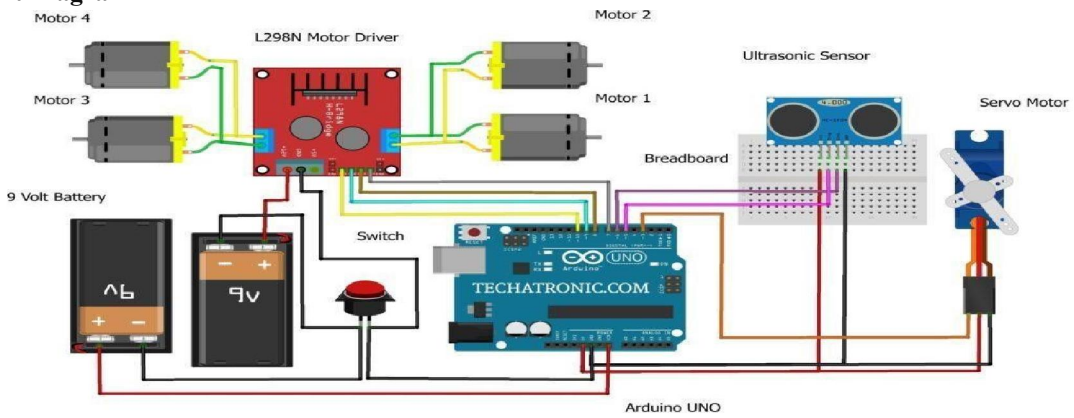

FIG 6.1a ROBOT MOTION CONTROLER

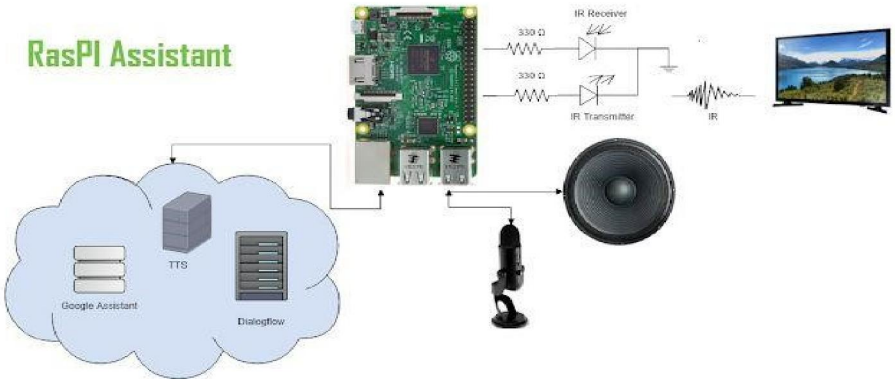

FIG 6.1b VOICE ASSISTANT

6.2 Talking System

The talking system is the one of the primary systems for our robot. There is a raspberry pi 4 is the back born for this system, which is powered by a 12V DC supply. The entire system is designed in such a way that the raspberry pi 4, speaker and mic are attached inside the body. While we need its help that time, we can ask doubts and it will rectify the entire doubt by searching in internet. By converting the audio to text format from this text it will search in internet after that it find the result and it will change the text to audio convert then it speaks the output.

6.2.1 Key Points

- Directly connect with internet
- Raspberry pi 4 consist of 4GB ram so more efficient
- Fast internet connectivity will give fast replay

6.3 Motion Control

It is a robot that walks automatically with the help of an ultrasonic sensor. An ultrasonic sensor is used in many other mini-projects like Smart robots. Obstacle avoiding robot also known as the autonomous robot. Which takes the decision self. if there is something in front of the robot it will change its path like a human. So' it is somewhere smart. it is the most popular project nowadays which is searched by most of the students nowadays. And everyone likes this robot. In this project, you will also learn many things like how to use the ultrasonic sensor. And using the serial monitor also. we will discuss the code also.

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6.3.1 Key Points

- An ultrasonic sensor has two parts one is a transmitter and another is the receiver that is known as a trigger and echoes.
- The trigger is the transmitter part and transmits the ultrasonic wave.
- Another part that is receiver an echo receive that transmitter ultrasonic waves transmitted from the trigger.
- Now we calculate that in how much time the ultrasonic waves return back to the receiver and divide by 2 because the time travel is double.

VI. Sample Code

```
import speech_recognition as sr import pyttsx3 import datetime import wikipedia import webbrowser import os import time import subprocess from ecapture import ecapture as ec import wolframalpha import json
import requests
print('Loading your AI personal assistant - G One')
engine=pyttsx3.init('sapi5') voices=engine.getProperty('voices')
engine.setProperty('voice','voices[0].id')
def speak(text): engine. Say(text)
engine. runAndWait()
def wishMe (): hour=datetime.datetime.now (). hour if hour>=0 and hour<12:
 speak ("Hello, Good Morning") print ("Hello, Good Morning") elif hour>=12 and hour<18:
 speak ("Hello, Good Afternoon") print ("Hello, Good Afternoon") else:
speak("Hello,Good Evening") print("Hello,Good Evening") def takeCommand(): r=sr.Recognizer() with sr.Microphone() as source:
print("Listening...")
 audio=r.listen(source)
 try:
 statement=r.recognize_google(audio,language='en-in') print(f"user said:{statement}\n")
 except Exception as e: speak("Pardon me, please say that again") return "None"
 return statement
speak("Loading your AI personal assistant G-One") wishMe()
if __name__=='__main__':
 while True: speak ("Tell me how can I help you now?") statement = takeCommand().lower() if statement==0:
 continue
 if "good bye" in statement or "ok bye" in statement or "stop" in statement:
speak('your personal assistant G-one is shutting down,Good bye') print('your personal assistant G-one is shutting down,Good bye') break
 if 'wikipedia' in statement:
speak('Searching Wikipedia...')
 statement =statement.replace("wikipedia", "") results = wikipedia.summary(statement, sentences=3) speak("According to Wikipedia") print(results)
 speak(results)
elif 'open youtube' in statement:
webbrowser.open_new_tab("https://www.youtube.com")
speak("youtube is open now")
time.sleep(5)
elif 'open google' in statement:
webbrowser.open_new_tab("https://www.google.com") speak("Google chrome is open now")
time.sleep(5)
elif 'open gmail' in statement:
webbrowser.open_new_tab("gmail.com") speak("Google Mail open now")
```

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```
time.sleep(5)
elif "weather" in statement:
api_key="8ef61edcf1c576d65d836254e11ea420"  base_url="https://api.openweathermap.org/data/2.5/weather?"
speak("whats the city name") city_name=takeCommand()
complete_url=base_url+"appid="+api_key+"&q="+city_name
 response = requests.get(complete_url)
 x=response.json() if x["cod"]!="404":
 y=x["main"] current_temperature = y["temp"] current_humidiy = y["humidity"]
 z = x["weather"] weather_description = z[0]["description"] speak(" Temperature in kelvin unit is " + str(current_temperature) + "\n humidity in percentage is " + str(current_humidiy) + "\n description " + str(weather_description))
print(" Temperature in kelvin unit = " + str(current_temperature) +
 "\n humidity (in percentage) = " + str(current_humidiy) + "\n description = " +
 str(weather_description))
 else:
speak(" City Not Found ")
elif 'time' in statement:
strTime=datetime.datetime.now().strftime("%H:%M:%S") speak(f"the time is {strTime}")
elif 'who are you' in statement or 'what can you do' in statement: speak('I am G-one version 1 point O your persoanl assistant. I am programmed to minor tasks like'
 'opening youtube,googlechrome,gmail and stackoverflow ,predict time,take a photo,searchwikipedia,predict weather'
 'in different cities , get top headline news from times of india and you can ask me computational or geographical questions too!')
elif "who made you" in statement or "who created you" in statement or "who discovered you" in statement:
speak("I was built by AKSHAY PRAKASH") print("I was built by AKSHAY PRAKASH")
elif "open stackoverflow" in statement: webbrowser.open_new_tab("https://stackoverflow.com/login") speak("Here is stackoverflow")
elif 'news' in statement: news =
webbrowser.open_new_tab("https://timesofindia.indiatimes.com/home/headlines") speak('Here are some headlines from the Times of India,Happy reading') time.sleep(6)
elif "camera" in statement or "take a photo" in statement: ec.capture(0,"robo camera","img.jpg")
elif 'search' in statement: statement = statement.replace("search", "")
webbrowser.open_new_tab(statement) time.sleep(5)
elif 'ask' in statement:
speak('I can answer to computational and geographical questions and what question do you want to ask now')
question=takeCommand() app_id="R2K75H-7ELALHR35X"
 client = wolframalpha.Client('R2K75H-7ELALHR35X') res = client.query(question) answer = next(res.results).text
speak(answer)
 print(answer)
elif "log off" in statement or "sign out" in statement: speak("Ok , your pc will log off in 10 sec make sure you exit from all applications")
subprocess.call(["shutdown", "/l"])
time.sleep(3)
```

VIII. FUTURE IMPROVEMENTS

- To future extension, we decided to control our robot using Bluetooth controlled joystick
- Change the robot body carboard into 3D material
- We plan to improve movement of robot
- We decided to implement a display on robot

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- Implement a high-quality speaker and mic
- Using PCBs for compactness, low signals noises and better integration**.** Fasterreal time processing with the use of private servers

IX. CONCLUSION

The purpose of this research was to identify effective strategies for dealing with repetitive motions identified in individuals with autism spectrum disorder. Based on the analysis conveyed, it can be concluded that there are multiple behaviour modification therapies important for the improvement of this behaviour. Future exploration into behaviour modification techniques could be useful to finding further therapy techniques. The amount this could improve the lives of others with repetitive motion behaviour's is worth exploring.

Everybody loves Talking Robots. It's like having a little pal to mess around with. If the robot is humanoid then it's more fun than ever. Among all other robots, humanoid robots suddenly become a 'he/she' instead of 'it'. Having a humanoid talking robot feels like awesome, but talking robots are seemingly complicated to make.

To make a robot talk we can go through two methods Speech Synthesis and Pre-recorded audio. Among them option a doesn't perform understandably well with Arduino. So, we are going for method Pre-recorded audio.

Finally our wish has been full filled as an identity of our project and our robot working. We would like to thank every one who belive us and support our project.

IX. APPENDIX

9.1 Project Modeling ny Using Solid Works

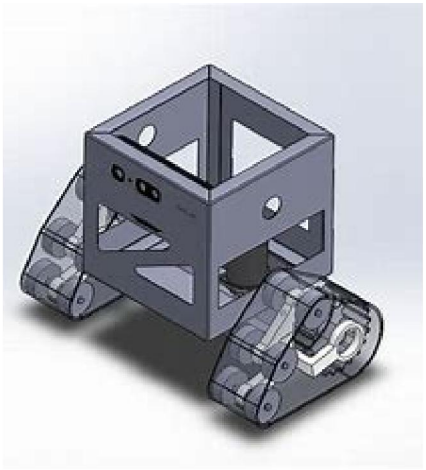

Fig 9.1.1 Starting Stage

Fig 9.1.2 Front View

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Fig 9.1.3 Back View

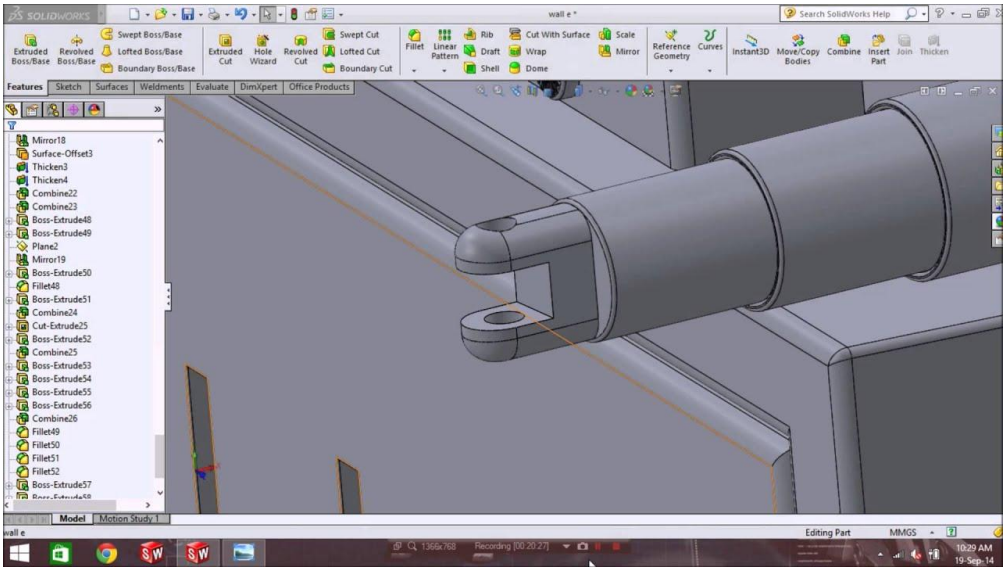

Fig 9.1.3 Design Using Solid works

9.2 Project Images

Fig 9.2.1 Front view

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Fig 9.2.2 Side View

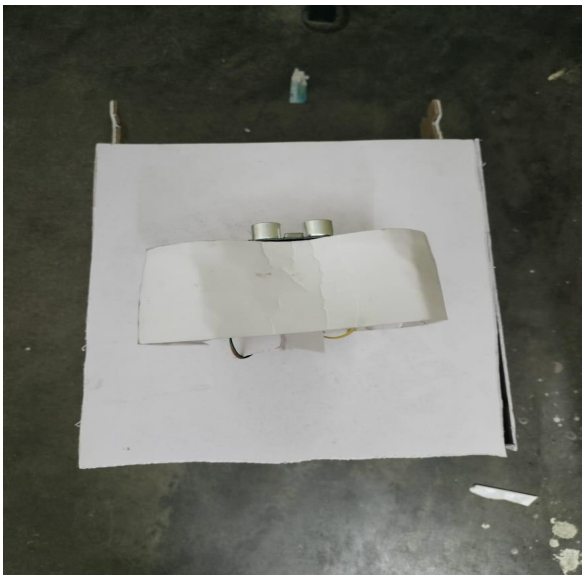

Fig 9.2.3 Top View

REFERENCES

[1]. Talking with a robot in ENGLISH (March 2005) L Stephen Coles

[2]. Building a talking baby robot, a contribution to the study of speech acquisition and evolution (November 2007) J. Serkhane, J.L. Schwartz, P. Bessière ICP, Grenoble Laplace-SHARP, Gravir, Grenoble

[3]. A Talking Robot and the Expressive Speech Communication with Human (December 2014) Hideyuki SAWADA

[4]. Smart talking robot Xiaotu: participatory library service based on artificial intelligence (April 2015) Fei Yao, Chengyu Zhang and Wu Chen

[5]. Speech Planning of an Anthropomorphic Talking Robot for Consonant Sounds Production (May 2002) Kazufumi Nishikawa, Akihiro Imai, Takayuki Ogawara, Hideaki Takanobu, Takemi Mochida, AtsuoTakanishi

[6]. Multilingual WikiTalk: Wikipedia-based talking robots that switch languages (August 2013) Graham Wilcock and Kristiina Jokinen

[7]. How Computers (Should) Talk to Humans (April 2006) Robert Porzel

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 2, January 2023
Impact Factor: 7.301

[8]. Artificial Intelligence-based Voice Assistant (October 2020) S Subhash, Prajwal N Srivatsa, S Siddesh, A Ullas, B Santhosh

[9]. VOICE ASSISTANT - A REVIEW (March 2021) Shabdali Suresh Shetty

[10]. Alexa-Based Voice Assistant for Smart Home Applications (July 2021) Asuncion Santamaria, Guillermo del Campo, Edgar Saavedra and Clara Jimenez

[11]. Obstacle avoidance with ultrasonic sensors (April 1988) J.Borenstein , Y. Koren

[12]. Obstacle Detection using Ultrasonic Sensors (April 2016) Delicia Perlin Rebelo,Cecilia Jane D'Silva, Linford William Fernandes, Linford William Fernandes

[13]. Obstacle detection using ultrasonic sensor for a mobile robot (July 2019) Joseph Azeta, Christian Bolu, Daniel Hinvi and Abiodun AAbioye

[14]. Performance comparison of Infrared and Ultrasonic sensors for obstacles of different materials in vehicle/ robot navigation applications (may 2016) Adarsh, Mohamed Kaleemuddin, Dinesh Bose, K I Ramachandran

[15]. OBSTACLE AVOIDANCE ROBOTIC VEHICLE USING ULTRASONIC SENSOR, ARDUINO CONTROLLER (February 2018) R. VAIRAVAN, S.AJITH KUMAR, L. SHABIN ASHIFF and C. GODWIN JOSE

[16]. Obstacle Avoiding Robot (January 2017) Faiza Tabassum, SusmitaLopa, Muhammad Masud Tarek

[17]. Obstacle Detection and Object Size Measurement for Autonomous Mobile Robot using Sensor (March 2013) FayazShahdib, Md. Wali Ullah Bhuiyan, Md.Kamrul Hasan, Hasan Mahmud

[18]. Obstacle Avoidance Algorithm for Small Autonomous Mobile Robot Equipped with Ultrasonic Sensors (May 2020) Maryna Derkach, DanyloMatiuk, nnaSkargaBandurova

[19]. Object recognition and obstacle avoidance robot(June 2009) Karthi Balasubramanian, R. Arunkumar, Jinu Jayachandran, Vishnu Jayapal, Bibin A. Chundatt and Joshua D. Freeman