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Humanoid: Max

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Abstract: ***Nowadays there are many assistants like Google voice assistant , Alexa…etc. Humanoid assistant is a assistant which move freely with you while assisting in your daily task such as informing you about today's weather. We have deeply studied some of the best research papers on Robotic, Machine learning and some very necessities of AutoML, so in order to get to a conclusion of what works the best for us. We have also studied about many other research papers on voice assistant as to how to create a basic voice assistant.***
The main idea behind this project is to make a bot which can move freely that can assist you in day-to-day tasks. It will respond and talk to you like your own friend. It will also work as your personal house assistant.
In this project we have basically worked on robotics. The aim of our project is to make a virtual Voice Assistant bot. The main motive is to first design the Humanoid and then program the features using our knowledge of programming. The working is based on Arduino microcontroller and Raspberry Pi microprocessor. The code is simulated on software (IDE) and later we interfaced with the hardware. We picked this as our design as robotics has come a long way and has become a part of our everyday life and also has a wide compass in the engineering field. For us the main task was to make such a model such a model in an similar a way, where the tasks are performed in an automated way so as to save time and costs.
Keywords: Information Diffusion, Face detection, Virtual Assistance, Lane Detection.

I. INTRODUCTION

When you are asked to envision a "robot" most people will tell you they imagine a piece
of machinery that resembles a human form.
Humanoid is an autonomous robot(car) capable of navigating your desk, recognizing you and greeting you, avoiding obstacles, keeping itself busy by exploring the house. It is an example of smart IoT, AI, ML enabled vehicles.
No one needs to drive the car. It is basically self controllable car and make use of sensors to detect objects, humans in their surroundings and are also capable of interacting with humans by recognizing them.
The main objective of our humanoid is to make her capable of doing the following things:

1) To friendly interact with everyone
2) To assist in various task such as emailing a person, booking an appointment, scheduling task, providing best suggestion as per situation etc
3) To assist by controlling smart appliances in your house.
4) Face Recognitio
5) Autonomously approaching a person

II. BOOK RESEARCH AND IT'S INPUT

A. Current Uses of Humanoid Robots

Humanoid robots are currently being implemented in a wide range of industries. Humanoid robots are commonly used in the entertainment industry. One popular attraction in America that uses these robots is the Hall of Presidents at the Walt Disney World theme park in Orlando, Florida. The hall contains robots created to imitate past and current presidents. Their human like appearance and actions add as an element of human being to the attraction, but being technologically fascinating. In terms of a product that is available to consumers, Sony developed a robot named Qrio which dances, runs, recognizes faces, maintains its balance, and can get up if knocked over. In the work force humanoid robots are currently a couple popular uses that will eventually be expanded upon. In many large companies along with some technological universities these robots do the work of a receptionist. These robots can have lots of features including greeting people, giving directions, booking an appointment, entertaining you by telling a joke, transferring phone calls and so on. Security is also another popular example where humanoid robots are trained and used along with regular forces. Tmsuk, a Japanese based company, created a robot named Robo-Guard. Its capabilities include using an elevator, patrolling round-the-clock, replacing its own batteries, and wielding a fire extinguisher.

B. Motivation

During our childhood days we all must watched movies like Star Wars, RoboCop, Terminator, Ironman. Our motivation came right from those days. As of today robots help us in most of our everyday activity and we don't even realize the importance. Though artificial intelligence is still on its way to change the way of controlling machines. Thus development of complete humanoid alone is a challenging task but nothing is impossible.

For voice interaction we got motivation from Siri, Alexa, Google voice assistant and for fully automated robot we got motivation from Sophia.

C. Existing Work

Max (humanoid bot) runs freely around the room avoiding obstacles using ultrasonic sensor. Max answers to the questions verbally like Alexa and Google assistant. Max can track your face and follow your face using the Pen tilt hat.

From all research we have done till now we come up with a thought that the main thrust is the output of spoken messages that heighten the user's awareness of the scope of their personal information, resulting in an improvement in the user's recall and recognition of information related to their activities. As a result, the cues provided by the interface must provide efficient support for notifications, reminders, alerts, and various kinds of search results. There is also the need to consider an additional requirement that has to do with the naturalness of the interaction: the right social cues that improve user's satisfaction and remembering performance.

III. DESIGN OF ARCHITECTURE OF HUMANOID

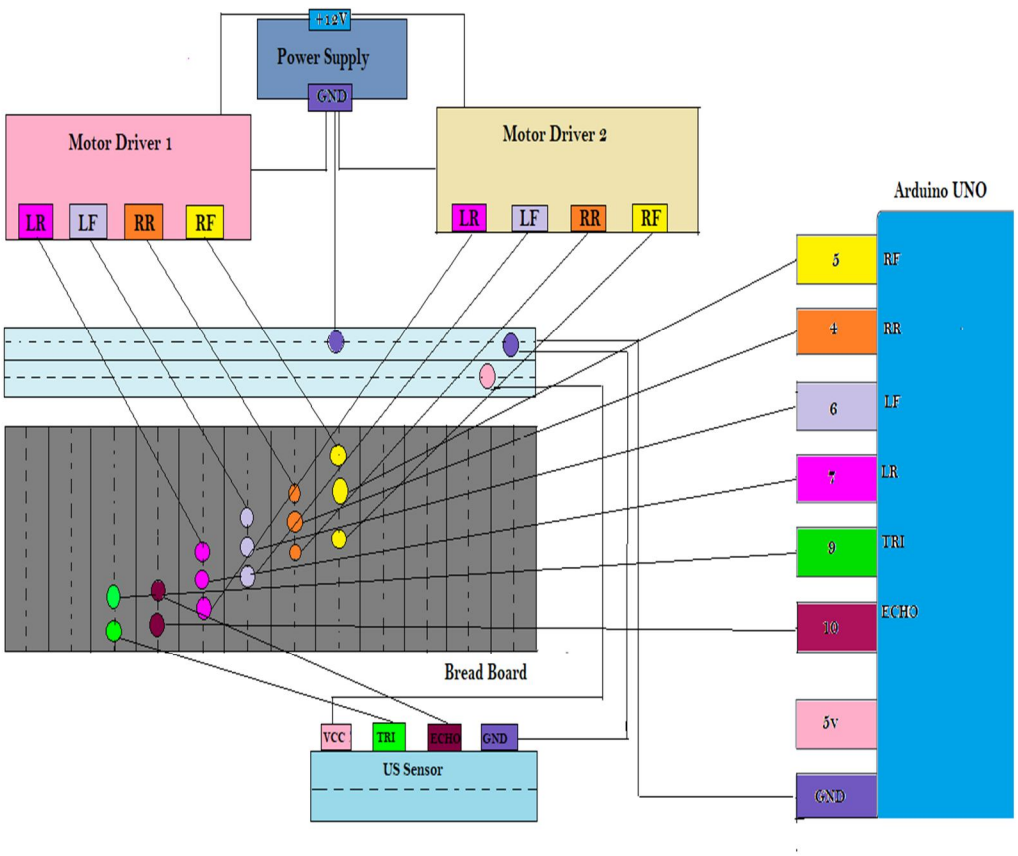

Fig 1:- connections to the Arduino board

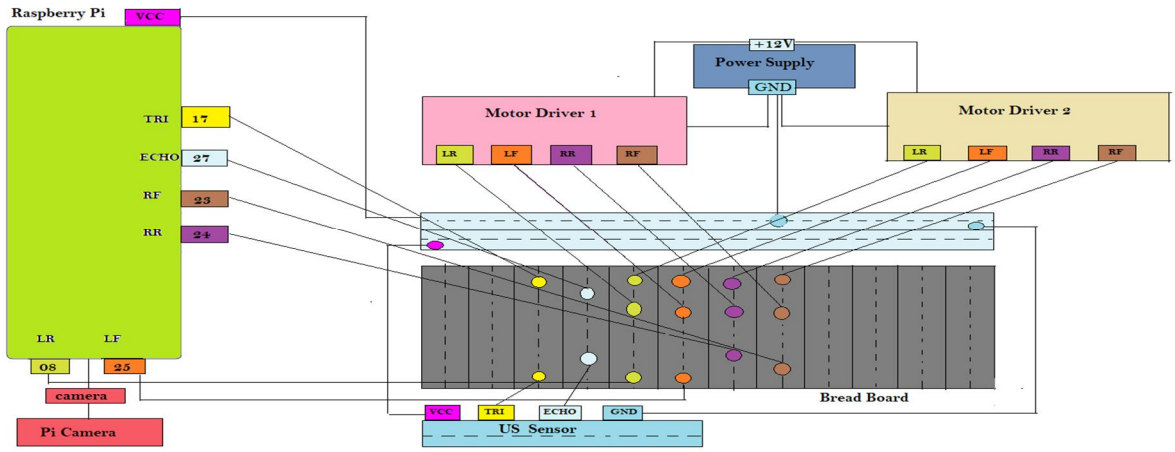

Fig 2:- connections to Raspberry Pi (part 1)

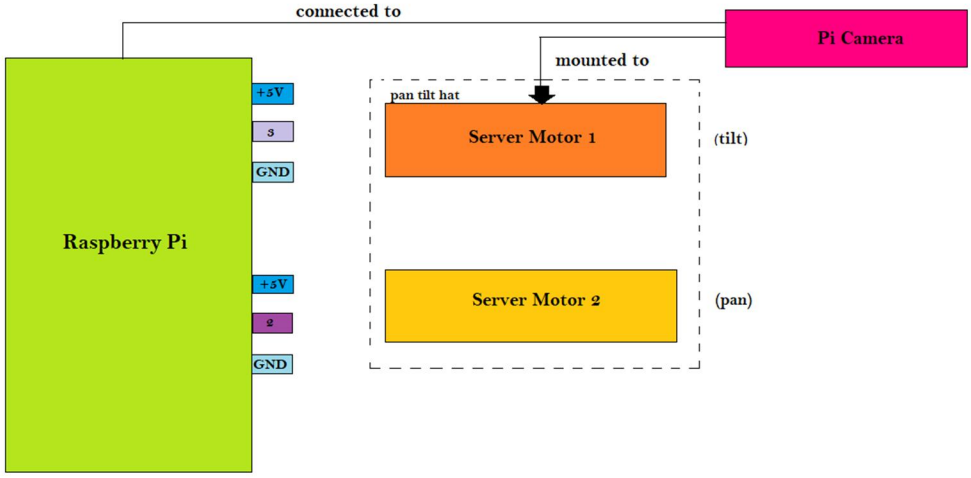

Fig 3:- connections to Raspberry Pi (part 2)

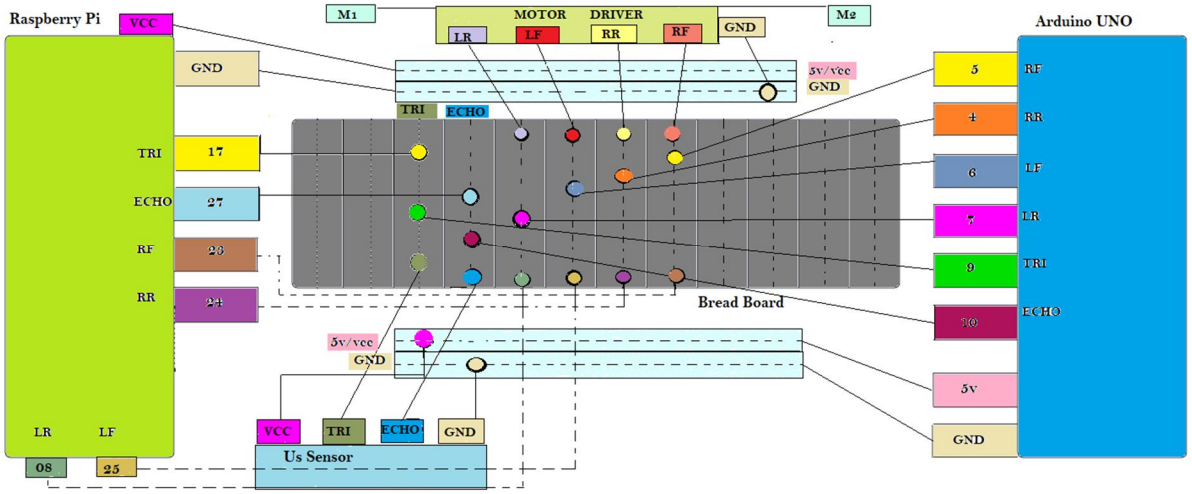

Fig 4:- full block diagram of Humanoid

IV. COMPONENTS USED

A. *Hardware*

1) Raspberry Pi (microprocessor)
2) Arduino Board (microcontroller)
3) Ultrasonic Sensors
4) Raspberry Pi Cameras
5) 12V DC motors
6) Sensor Motors
7) L2989 Motor Controllers
8) 4 rubber tires
9) Breadboard
10) 12V adapter
11) Wooden Planks
12) Regular wires
13) Jumper wires
14) USB mic
15) Speakers
16) Pan tilt hat

B. *Software*

1) Python - OpenCV (raspberry pi)
2) C/C++ - Arduino UNO

V. OUR SOLUTION

We intend to bring robotics to the doorsteps of every individual, so that everyday task becomes seamlessly easy. It can be extended to the following use cases-

1) As a receptionist.
2) As a trained military in security forces.
3) As a trained gatekeeper
4) Being a friend in a homely environment

A. *Target Audience*

While developing a Robotic project , it is super important to know the target audience. To keep ourselves at the position of the audience and to understand their needs. So, keeping this in mind making the project in line with the requirements. And as we constantly say – we intend to bring Robotics easily at the doorsteps.

B. *Open - Source Nature*

There are already lots of humanoids in the market. But very few people are aware of it because they are mostly costly or they need a a lot of knowledge for operation.

C. *User-friendliness*

This is something that is missing in the humanoids that already exist. With ‘Max ‘ , we intend to make robotics very user friendly so that everyone can use the benefits of using robotics in our day to day life without the need to really learn about it.

VI. CONCLUSION AND FUTURE SCOPE

In this we got knowledge of Arduino board, Raspberry Pi and hardware stuff.

The programming and moving of the robot proved to be more difficult. Though the team had prior programming experience but none of us has worked before for such an intense programming project so we faced some of our major problems when the team was creating brand new programs for the robot like the final moving program which allowed the robot to move freely though its movements were not 100% accurate, program for the virtual voice assistance and so on. The vision program was completed with a little more success.

Introduction to machine learning can help to improve the performance as the efficiency will increase, if the algorithm starts learning by itself and starts avoiding unnecessary calculations at the familiar places. Also if the vehicle can keep track of locations and obstacles faced when it is travelling & save the data so that it can be used for future references, for the next time for some similar circumstances.

VII. ACKNOWLEDGEMENT

We express my profound thanks to our project coordinator and mentor Prof Rishikesh Yeolkar for his expert guidance, encouragement and inspiration during this project work. We would also like to thank Prof. Dr. Rekha Sugandhi, Head of Department of Information Technology, MIT School of Engineering, MIT-ADT University, Pune for providing necessary facilities in completing the project.

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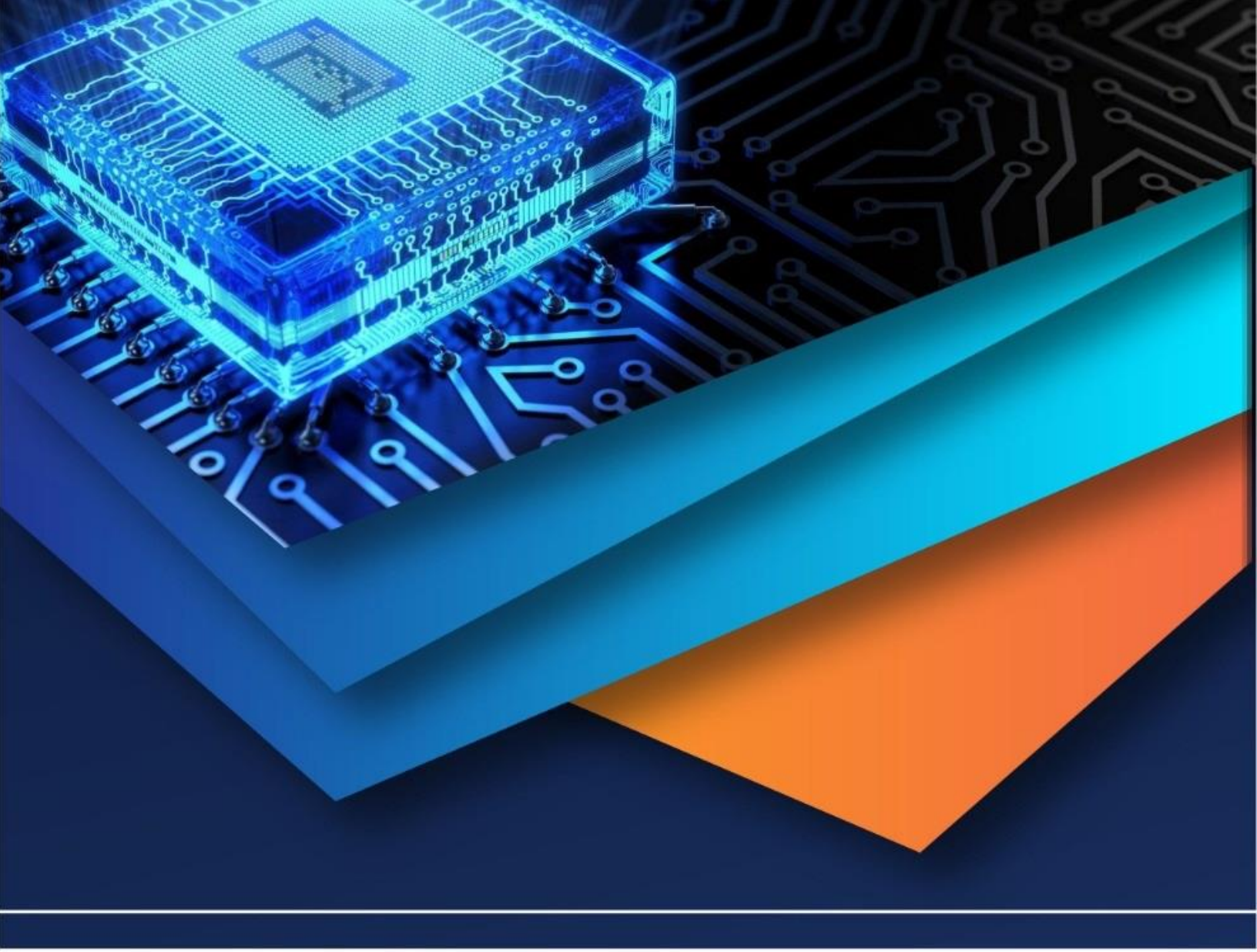

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