



WIFI CONTROLLED ROBOT FOR GERIATRIC ASSISTANCE

Dr. Anita Harsoor^{*1}, Gurushantayya^{*2}, Harsha M S^{*3}, Kartik^{*4}

^{*1} Professor, Department of Computer Science and Engineering PDA College of Engineering, Kalaburagi, Karnataka, India

^{*2,3,4} B.E Student, Department of Computer Science and Engineering PDA College of Engineering, Kalaburagi, Karnataka, India

Abstract :

In the Present period the use of robots has been used in a lot of operations. Designing an unmanned vehicle that can be controlled via remote device and move in places where humans might not be suitable to reach shall break numerous problems of operations similar as espionage, surveillance, hunt and deliverance and also in the sphere of wisdom and exploration. A wireless communication link between the robot and phone has been equipped and controlled with help Wi- Fi network. To raise the ease of use of the real world effects and perfecting the effectiveness of its operation, incorporating of real world effects by removing gap from real and virtual world objects with Wi- Fi. Perpetration done using Camera and Arms for Surveillance and to make some conduct. Wi- Fi will be used to control electric vehicle for parameters like Forward, Backward, Right, Left etc.

1. INTRODUCTION

The term Internet of effects appertained to has bedded with electronics, software, detectors which is swapping data via internet. The benefit is that IoT bias and services can interact with each other and produce lesser edge, ameliorate ease of use, give

better capability, lesser choice, lead to husbandry of scale and potentially lower unit cost. A robot is a software controlled mechanical device that uses detectors to guide one or further end effectors through programmed movements in a work space in order to manipulate physical objects. It's a fleetly growing field, as we continue to probe, design and make new robots that serve colorful practical purposes, whether domestically, commercially or militarily. The Wi- Fi Controlled Robot is made using Node MCU as a control unit. To control the brace of Motors, we used Motor motorist Module. We can power on the circuit using any battery as the power demand is further than 5V. This specialized enhancement together with the need for high performance robots created briskly, more accurate and more intelligent robots using new robots control bias, new motorists and advanced control algorithms. In this largely developing society time and man power are critical constrains for completion of task in large scales. The robotization is playing important part to save mortal sweats in utmost of the regular and constantly carried workshop. One of the major and most generally performed workshop is picking and placing of jobs from source to destination. The pick and place robot is a microcontroller grounded mechatronic system

that picks the object from source position and places at asked position, according to the Command given by the remote basic architecture is shown in fig 1.

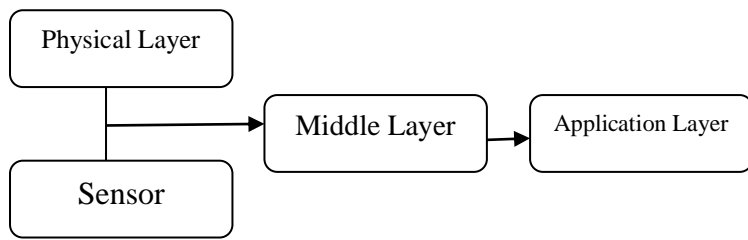


Fig1: Basic Architecture of IOT

A remote Control car is used to search missions. It is used in mean to be in a search for natural disasters. It has accomplished with the autonomous development to avoid obstacles if they are not visible by driver. Requirements for it's implementation are Camera, Ultrasonic sensor, Bluetooth Servo Motor, Arduino UNO board, Wi-Fi router, Android studio. This application can make search operation more easier [1].

A Robot is controlled with the help of Bluetooth it is useful in moving vehicle forward, backward, left, right are Arduino UNO (ATMEGA 32), Bluetooth module (HC-05), Smart phone, Motor driver (I293D). Main purpose of this robot is to detect hidden mines [2].

A phone Controlled Bluetooth robot is designed to control the vehicle and capture live streams and videos at required location. Requirements for its implementation are Arduino Uno Board, DC Motors, Uart, L293D Motor Driver IC, Power adapter [3].

Android Based Wi-Fi Controlled robot using Raspberry Pi implementation is done for robot forward, backward, left, right and to display live stream of video using USB camera and raspberry pi board. Most inventive application is implemented to make people lives easier [4].

Wi-Fi controlled robot using node MCU. This is an embedded system. Aim of this project was controlling a robot from remote location of more than 1000 miles away. For its implementation are Power Supply, Node MCU, Motor and Motor Driver L293D, ESP2866 Wi-Fi module, wired interface. Controlling of the robot is tested successfully over the miles and application found efficient [5].

Robot is a reprogrammable, multifunctional device which is primarily designed to do work like human such as pick and place, loading and unloading, surveillance, health care, industrial, aerospace application. Robots are useful to perform dangerous and accurate work to improve productivity as they can work 24 hours without rest Aim of this project was to control motion and speed of robot using Bluetooth of android device [6].

Android smart phone to control robot and other system provide great advantage to industries with the help of this system current status of all respective machines can be maintained from the feedback from PID so with this errors will be removed from the system. This paper by providing the design architecture for creating a robotic system which can be controlled very easily and can be implemented in various parts

of daily life. Main objective of this paper is providing robotic architecture which can be controlled by smart phone with Bluetooth technology [7].

2. SYSTEM OVERVIEW

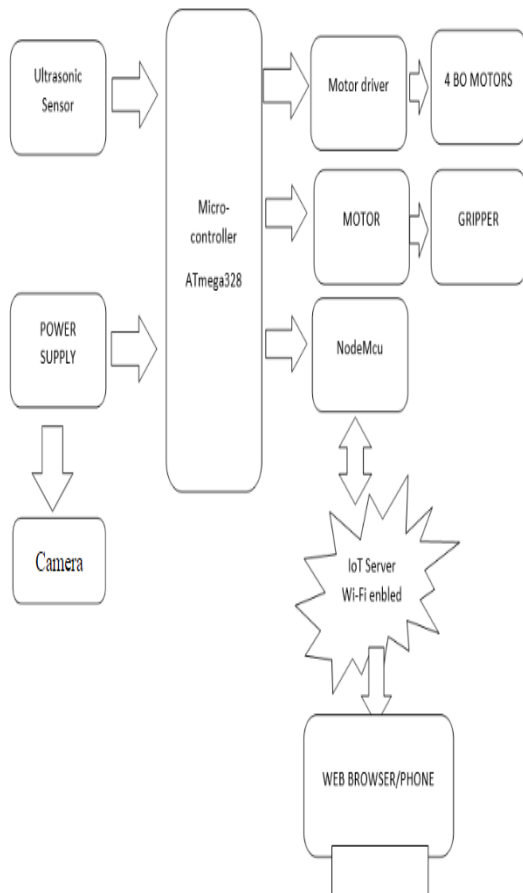


Fig 2 : Block Diagram of the Proposed System

2.1 Functional Unit Description :

In the figure we shown the hardware requirements & Technical approach in the way to design the system. The system consists of mainly parts like Microcontroller (ATmega328), Sensors, LCD display, which are described briefly below.

2.2 Microcontroller ATMEGA328 :

Arduino UNO is an open source prototyping platform based on ATmega328 microcontroller.

It consists of 14 digital input/output (0) pins, six analogue inputs, a USB connection for programming the on-board microcontroller, a power jack, an ICSP header and a reset button. It is operated with a 16MEz crystal oscillator and contains everything needed to support the microcontroller.

2.3 DC MOTOR (BO) Battery Operation :

DC motor converts electrical energy into mechanical energy. Why DC gear motor used in robot Motor control circuit. DC MOTOR concept is where gears reduce the speed of the vehicle but increase its torque is known as gear reduction. In DC motor is assembled with multiple gear setup. Speed of motor is counted in terms of rotations of the soft per minute is called RPM. RPM means Revolution Per Minute. The setup assembles helps to increasing the torque and reduces the motor speed. All microcontroller based Robots this type of DC motor can be used as shown in fig 2.

3. COMMUNICATION

Communication is the exertion of conveying information through the exchange of dispatches, or information. The system which is to displays the coming station information. To establish the communication between the station and Train we using RF communication system. Node MCU is a microcontroller which is connected to IOT through internet. MCU will admit the ON OFF packets from and switches appliances respect to signal. It provides unequaled capability to bed Wi- Fi capabilities within other systems, or to serve as a standalone operation, with the smallest cost, and minimum space demand as shown below. Arduino UNO Arduino UNO is a low- cost, flexible, and easy- to- use programmable open- source microcontroller board that can be integrated into a variety of electronic systems. Board has six analog input legs A0 through A5. These legs can read the signal from an analog detector like the moisture detector or temperature detector and convert it into a digital value that can be read by the microprocessor

3.1 Node MCU (ESP8266) :

Node MCU is a microcontroller which is connected to IOT server through internet . MCU will receive the ON OFF packets from server and switches appliances respect to server signal. It provides unsurpassed ability to embed Wi-Fi capabilities within other systems, or to function as a standalone application, with the lowest cost, and minimal space requirement as shown fig 3.



Fig 3 : Node MCU

3.2 Arduino UNO :

Arduino UNO is a low-cost, flexible, and easy-to-use programmable open-source microcontroller board that can be integrated into a variety of electronic projects. Board has six analog input pins A0 through A5. These pins can read the signal from an analog sensor like the humidity sensor or temperature sensor and convert it into a digital value that can be read by the microprocessor as shown in fig 4.

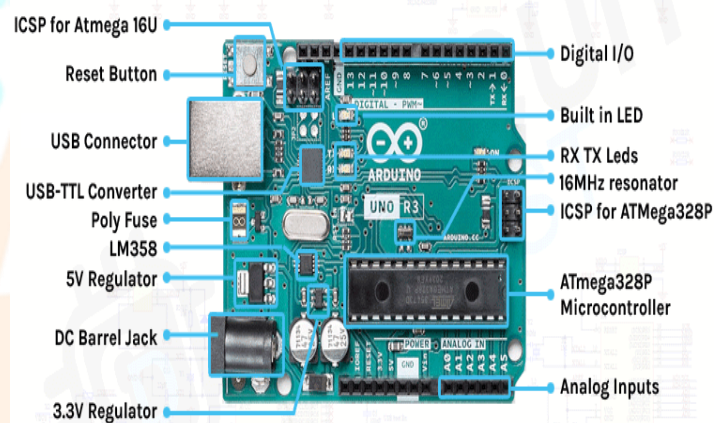


Fig 4 : Arduino UNO

4 . METHODOLOGY

The Proposed system aims at designing a Robot which is controlled through an Android phone over Wi- Fi technology. The Robot can be moved in all the four directions(front, back, left and right) through predefined keys assigned in the android operation. The nonstop 360 degree visual is observed with the help of camera and the person can see the objects through a device(Android device) that displays a videotape streaming of what the robot sees. The presented robot arm control can be used for Pick and Place any object from one place to another place. It can be a spherical robot furnishing movement in vertical, perpendicular and rotational axes. The controlling device for the robotic controlling in the design is a Microcontroller. An overview of the Autonomous Pick and Place Robot

actions is as follows. The robot originally follows the command given through the android phone as shown in fig 5.

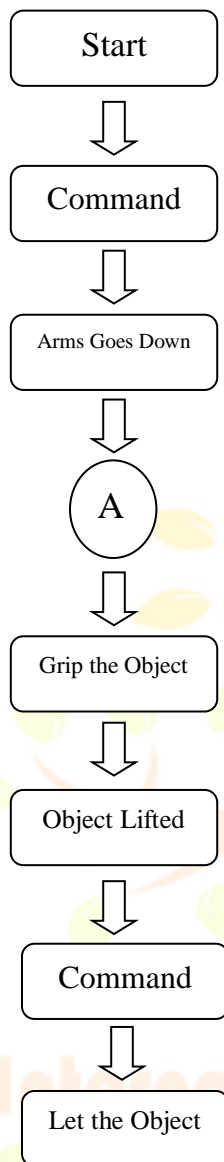


Fig 5 : Flowchart of working the Robot

5. RESULT

Prototype development work has been carried out with a robot. The Robot is driven by an knot MCU through Wi- Fi. A motor regulator is also attached to the Node MCU to control the movement of the robot RC Car is controlled by Android phone which include Blynk operation, For power force, the Node MCU is connected with a 12 volt power supply. One of the crucial benefits of the Wi- Fi- controlled senior adjunct is its capability to be operated the robot ever. Without the help of Caregivers and family members the elder people can cover themselves with the help of robot and they can see their girding with help of camera, they can pick the objects from the place where they want and place from one position to another.

Software used

Blynk is an IoT platform for IOS or Android smartphones that is used to control Arduino, Raspberry Pi and NodeMCU via the Internet, Blynk IOT user interface is as shown in fig 6.

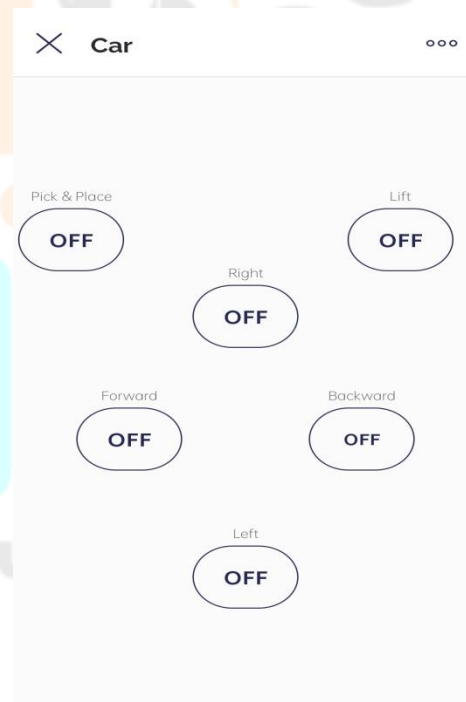


Fig 6 : User Interface

Commands :

Forward Movement : The act of moving forward (as toward a goal), as shown in fig 7(a) and 7(b).

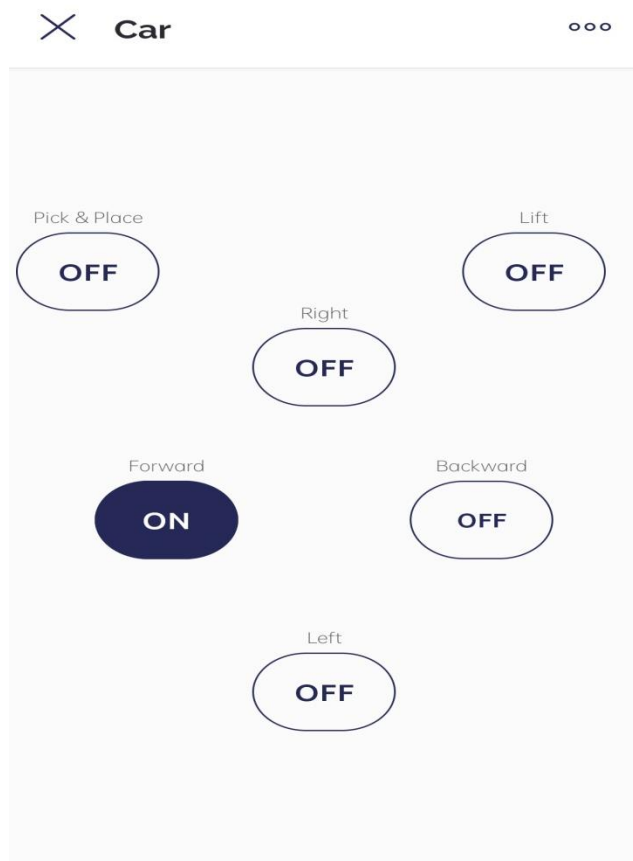


Fig 7(a) : Interface of Forward Movement

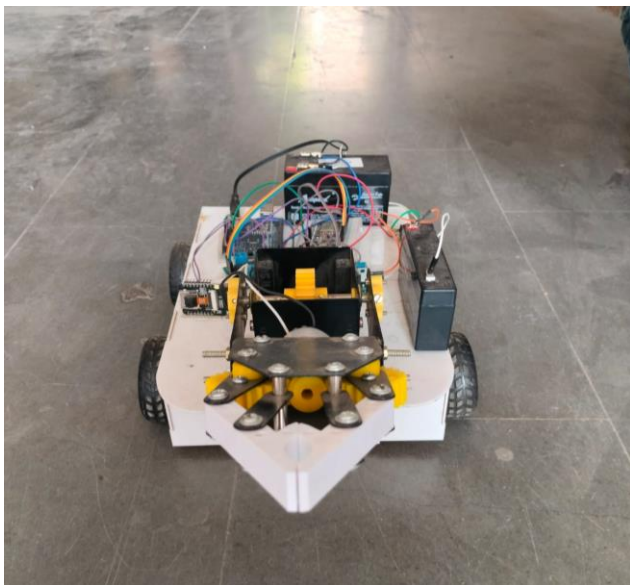


Fig 7(b) : Forward Movement

Backward Movement : The Robot moves Backward using Blynk Application as shown in fig 8(a) and the output is shown in fig 8(b).

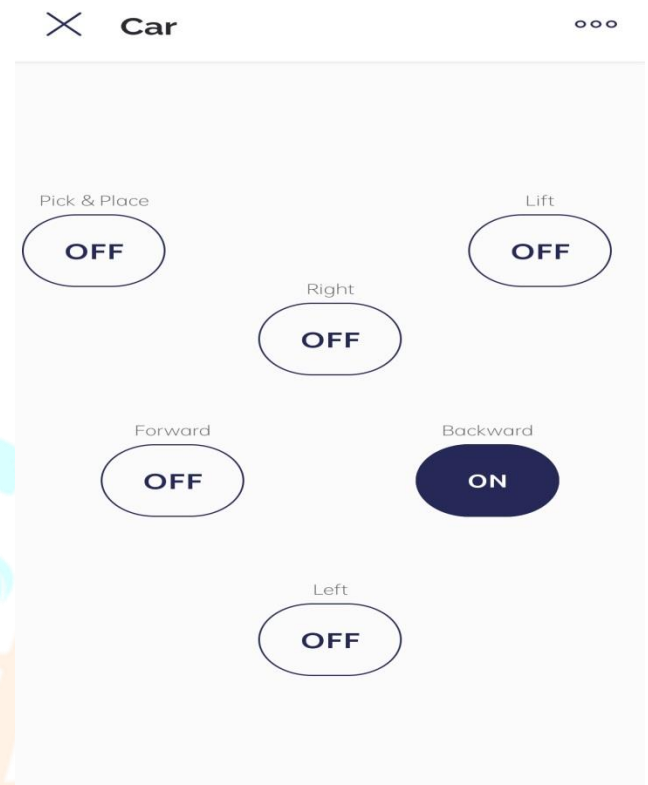


Fig 8 (a) : Interface of Backward Movement

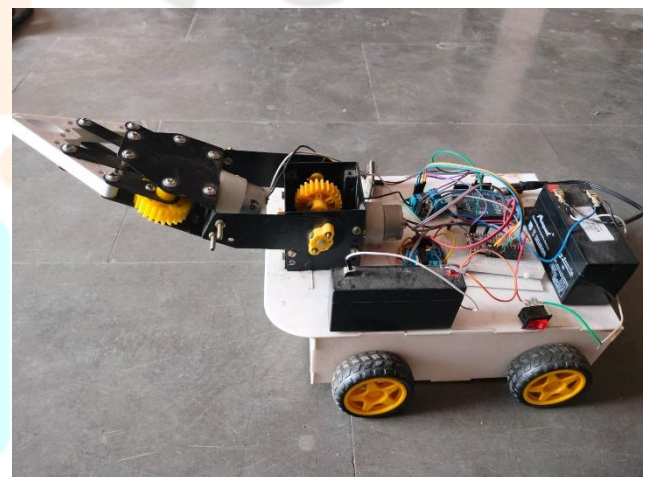


Fig 8(b) : Backward Movement

Left Movement : The Robot moves Left using Blynk Application as shown in fig 9(a) and the output is shown in fig 9(b).

Right Movement : The Robot moves Right using Blynk Application as shown in fig 10(a) and the output is shown in fig 10(b).

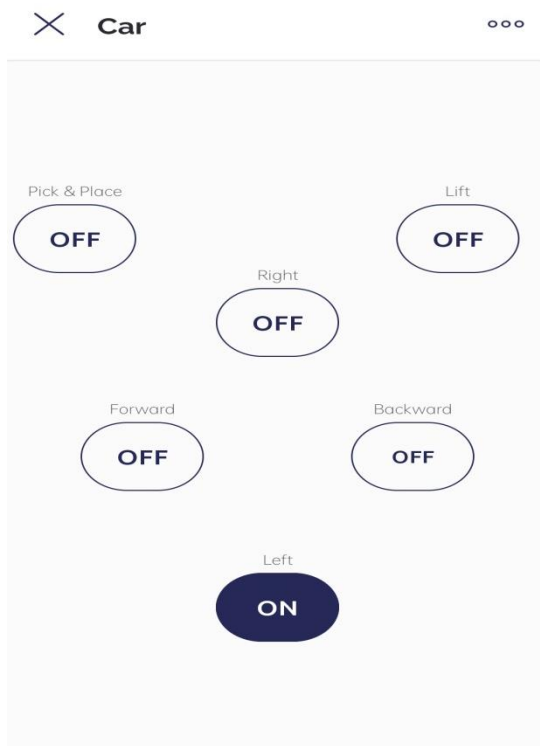


Fig 9(a) : Interface of Left Movement

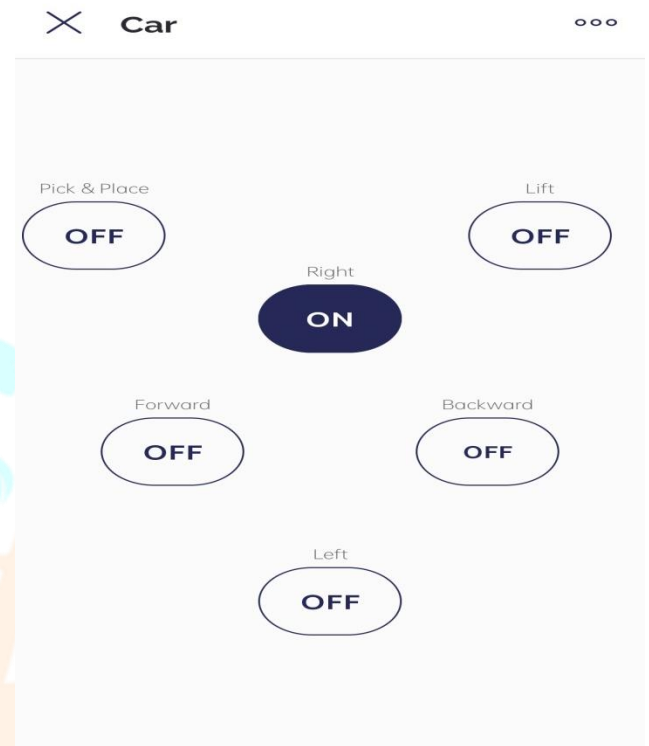


Fig 10(a) : Interface of Right Movement



Fig 9(b) : Left Movement

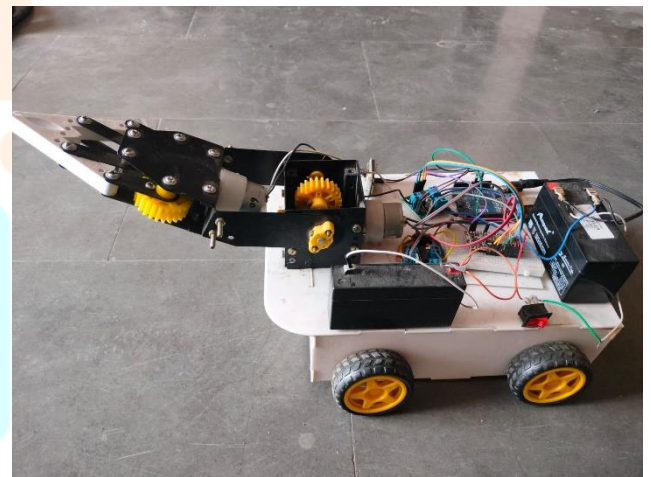


Fig 10(b) : Right Movement

Pick : Picking an object as shown in fig 11(a) and 11(b)

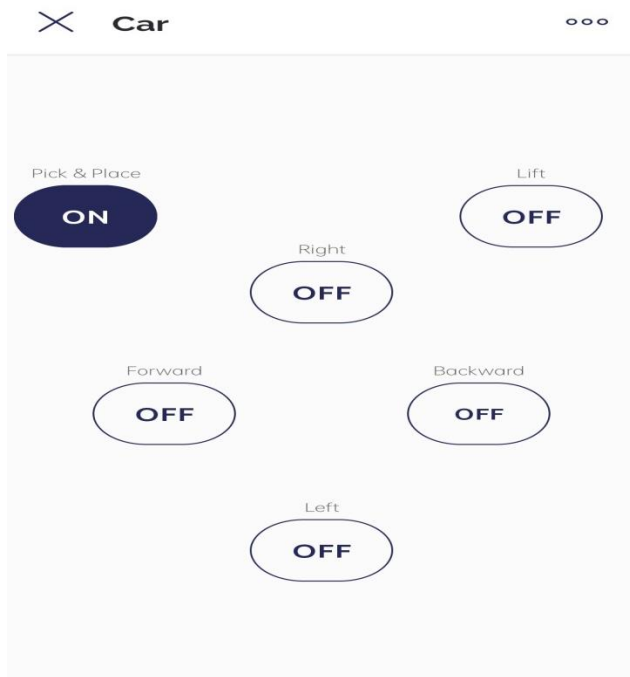


Fig 11(a) : Interface of Pick and Place

Place : Placed as shown in fig 12(a) and 12(b).

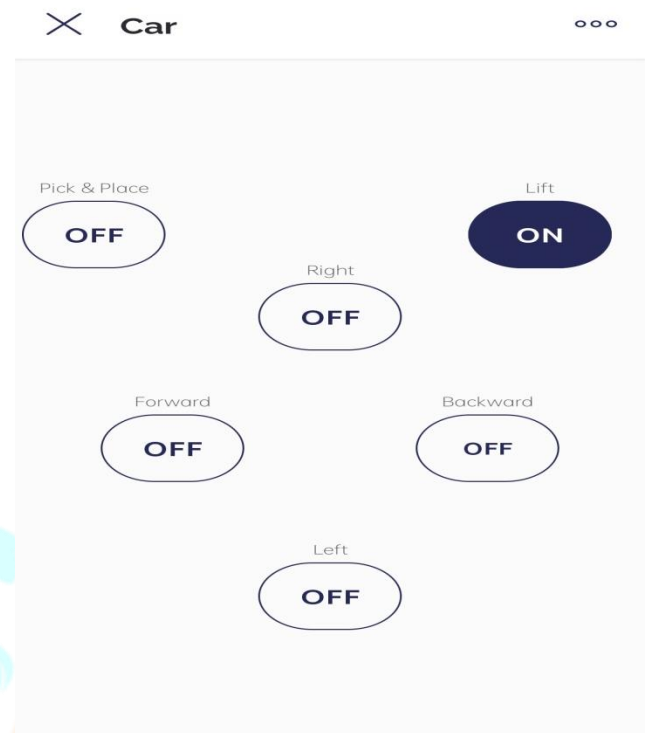


Fig 12(a) : Interface of Lift



Fig 11(b) : Picking an object

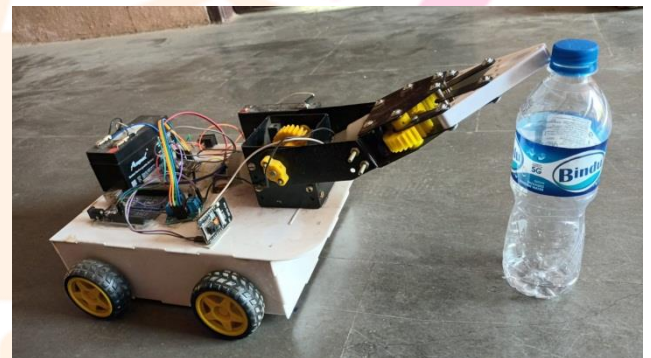


Fig 12(b) : Placed

6. CONCLUSION

Wi-Fi- controlled sidekicks hold great pledge for furnishing care and support to the aged population. By allowing remote control of a range of home terrain aspects, as well as foster communication with family members and caretakers and remind seniors to take their requirements. Wi- Fi controlled sidekicks have the eventuality to grow and offer decreasingly more sophisticated chops in order to address the unique requirements of the aged population.

REFERENCES

- [1] Yuxin, Jing, Letin Zhang, Irwin Arce, Aydin Farajidavar “AndroRC:An Android Remote Control Car Unit for Search Missions” :Integrated Medical System Laboratory Dept. of Electrical and Computer Engineering America, United States.2015, PP.1-5
- [2] AyanMaity, Avijit Paul, PriyankaGoswami, Ankan Bhattacharya “Android Application Based Bluetooth Controlled Robotic Car”International Journal of Intelligent Information systems, Department of Electronics and Communication Engineering, Department of Computer Science and Engineering India,Nov 29, 2017, ISSN: 2328-7675, pp.62-66
- [3] Kena Patel, Bhavna K. Pancholi “A Novel fire extinguishing vehicle controlled by androidapplication” Department of Electrical University of Baroda India IEEE International Conference on Smart Technologies and Management for Computing, ISSN 2231-4903, Vol.08, Issue 01, January-2018, PP.417-422
- [4] MehmetcanGule, Murat, Orthun “Android Based Wi-Fi Controlled robot using Raspberrypi”Computer Engineering Department Turkey 2017 IEEE International Conference of Computer Science and Engineering, ISSN - 4799-3528, PP.978-982
- [5] Jan Nadvornik, Pavel, Smutny “Remote Control Robot Using Android Mobile Device” Department of Computer System and Instrumentation 2016, ISSN : 2319 - 8753, PP. 373-378
- [6] Rahul Kumar, Ushapreethi, PravinR.Kubade, Hrishikesh Kulkarni “Android Phone controlled Bluetooth Robot”International Research Journal of Engineering and Technology 2016”, -ISSN: 2395 - 0056, PP-104-114
- [7] Jayesh George, Adithyasreyaj, DanielJoseph, Sajeer P “Android Controlled Smart Car”International Journal of Computer Engineering in Research trend Volume2, Issue 12, December-2015, pp.1087-1090 ISSN (O): 2349-7084
- [8] ISSN Saurabh Khoje, Devendra Urad, Monika Shirke, Anita Shinde “Robotic Control using Android Application ” vol 7, 2017, ISSN 0975-9646, pp.773-776
- [9] J Anitha, Y Thoyajakshi, A. Ramaya, V.Sravani, Prashant Kumar “Intelligent Parking System using Android Application”Vignn’s Institute of Information and Technology 2017, ISSN-5090-2889, PP.165-174

[10] Chan Chung Hung Faculty of Computer Networks “Wi-Fi remote control car via mobile device”2013, PP. 1-14

