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LIVE HUMAN BEING DETECTION WI-FI CONTROLLED ROBO

Bonthu Balarama Krishna, Ms.Vijaya Swarupa

[1]B.tech Student, Department Of Electronics and Computer Engineering, J.B Institute of Engineering and Technology

[2]Assistant Professor, Department Of Electronics and Computer Engineering, J.B Institute of Engineering and Technology

Abstract: The main aim of this project is to detect the human being by using a wi-fi controlled Robot, which have the sensors that detects the presence of the human being and indicates the presence to user. As it is a wireless Robot it can be easily mobilized and can be controlled. This can be used to detect terrorists/thief inside the building. Wi-Fi (Short for Wireless Fidelity) is a wireless technology that uses radio frequency to transmit data through the air. Wi-Fi has initial speeds of 1mbps to 2mbps. Wi-Fi transmits data in the frequency band of 2.4 GHz. It implements the concept of frequency division multiplexing technology. Range of Wi-Fi technology is 40-300 feet. In this project we use micro controller, which is programmed to control the input and output modules interfaced to it. The controller makes use of a PIR based input sensor to sense the human being and give us an alert indication through buzzer. The controlling device of the whole system is a Microcontroller to which Wi-Fi module, PIR sensor, Buzzer and DC motors are interfaced. We can control the robot using smart phone through Wi-Fi. When the user press the button on smart phone this data is received the Wi-Fi module which is connected to the microcontroller. The Microcontroller processes this data and acts accordingly on Robot motors. PIR sensor is interfaced to the Microcontroller which continuously monitors human presence and intimates to the controller. The controller alerts through Buzzer if human presence is present.The Microcontroller is programmed using Embedded C language.

I. INTRODUCTION

In various scenarios, such as search and rescue missions, security surveillance, or remote monitoring, there is a need for autonomous robotic systems capable of detecting the presence of live human beings within a designated area. This problem statement focuses on the development of a Wi-Fi controlled robot that can autonomously detect the presence of live human beings in real-time and transmit relevant data or video feeds to a remote operator for further analysis and decision- making

Challenges: The development of a live human being detection Wi-Fi controlled robot presents several challenges:

Human Detection Accuracy: The robot must accurately detect live human beings, even in challenging conditions such as low light, occlusions, or cluttered environments.

Real-Time Processing: The system should perform human detection and data transmission in real-time to provide timely information to operators.

Wireless Communication: Ensure reliable and secure Wi-Fi communication between the robot and remote

operator, considering potential signal disruptions and data privacy. **Power Efficiency**: Optimize power consumption to maximize the robot's operational duration, especially in situations where recharging may be challenging.

The challenge at hand involves the development of a WiFi-controlled robotic system with an embedded live human detection capability. This project aims to create a versatile and remotely operated robotic device, enabling users to navigate through environments while actively identifying the presence of live human beings. The system's core functionalities include establishing a robust WiFi communication infrastructure for remote control, implementing sensors for live human detection, and ensuring obstacle avoidance for safe navigation. A user-friendly interface, accessible through a web-based application or mobile app, is crucial for seamless control and real- time feedback. Security measures to prevent unauthorized access, efficient power management, and scalability for future upgrades are also integral components of this project. The successful execution of this design would result in a powerful tool
applicable to various scenarios such as surveillance, security, or remote exploration, contributing to the advancement of robotic technology.

II. LITERATURE SURVEY

The literature survey for the project on a WiFi-controlled robotic system with live human detection encompasses a broad exploration of existing research, academic contributions, and technological advancements in related fields. Studies on wireless robotics form a foundational component, delving into the challenges and solutions associated with utilizing WiFi and other wireless communication protocols for remote control and data transmission in robotic systems. A thorough examination of human detection techniques reveals a rich landscape of research, ranging from traditional infrared sensors to cutting-edge approaches like computer vision and machine learning algorithms. Understanding the strengths and weaknesses of these methods is crucial for informed design choices. Additionally, the survey explores literature on obstacle avoidance in robotics, investigating the role of proximity sensors, LiDAR, and computer vision in enabling safe navigation through dynamic environments. Human-robot interaction studies provide insights into designing user-friendly interfaces, enhancing teleoperation experiences, and incorporating feedback mechanisms. Power management principles for mobile robotic systems, security considerations for wireless communication, and ethical implications in surveillance applications are other critical facets addressed in the literature survey. Furthermore, an examination of scalable and upgradable robotic systems, real-world applications, and user studies contributes valuable perspectives for the project's development. This comprehensive survey not only informs the project's design and implementation but also positions it within the broader landscape of current research and technological advancements in robotics. Formerly, dogs were used because of their highly sensitive nature. One major drawback was dogs couldn’t work independently; they need human assistance. It means, the need is totally or partially independent to human factor.

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Existing System

The existing system of a WiFi-controlled robot designed for object transportation represents a significant advancement in the realm of automated material handling. Operating within a framework of wireless communication, this technology allows users to remotely control the robot's movements, offering a versatile solution for transporting objects across different locations. Equipped with sensors or cameras for navigation and obstacle avoidance, the robot ensures safe and efficient movement, mitigating the risk of collisions. The system's payload capacity is carefully considered, accommodating a range of objects based on size and weight. Real-time monitoring features enable operators to observe the robot's actions and receive feedback during the transportation process.

The scalability of the system allows for the potential integration of multiple robots to handle larger workloads or cover more extensive areas. Safety features, including emergency stop mechanisms and collision detection, prioritize the well-being of both the robot and its surroundings. By automating the transportation of objects, this WiFi-controlled robot contributes to increased operational efficiency, particularly in industries where routine material handling tasks are prevalent. As technology evolves, further enhancements such as advanced sensors and machine learning algorithms may continue to refine and expand the capabilities of these systems.

ANALYSIS

The main aim of this project is to detect the human being by using a wi-fi controlled Robot, which have the sensors that detects the presence of the human being and indicates the presence to user. As it is a wireless Robot it can be easily mobilized and can be controlled. This can be used to detect terrorists/thief inside the building. Wi-Fi (Short for Wireless Fidelity) is a wireless technology that uses radio frequency to transmit data through the air. Wi-Fi has initial speeds of 1mbps to 2mbps. Wi-Fi transmits data in the frequency band of 2.4 GHz. It implements the concept of frequency division multiplexing technology. Range of Wi-Fi technology is

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In this project we use micro controller, which is programmed to control the input and output modules interfaced to it. The controller makes use of a PIR based input sensor to sense the human being and give us an alert indication through buzzer. The controlling device of the whole system is a Microcontroller to which Wi-Fi module, PIR sensor, Buzzer and DC motors are interfaced. We can control the robot using smart phone through Wi-Fi. When the user press the button on smart phone this data is received the Wi-Fi module which is connected to the microcontroller. The Microcontroller processes this data and acts accordingly on Robot motors. PIR sensor is interfaced to the Microcontroller which continuously monitors human presence and intimates to the controller. The controller alerts through Buzzer if human presence is present. The Microcontroller is programmed using Embedded C language. he proposed WiFi- controlled robot with a Passive Infrared (PIR) sensor for live human detection in disaster- stricken areas holds immense potential in revolutionizing traditional search and rescue operations. In the wake of natural or man-made disasters, the ability to swiftly locate and aid survivors is paramount, often hindered by the complexities of the disaster environment. This analysis aims to delve into the various aspects of the project, exploring the technological foundations, operational mechanisms, and potential implications of deploying such a system in real-world scenarios. By dissecting the integration of the PIR sensor, the role of the PIC microcontroller, the application of WiFi connectivity, and the overall system architecture, we seek to evaluate the project's efficacy in enhancing the speed and precision of search and rescue missions. Additionally, this analysis will consider the project's scalability, adaptability to dynamic disaster scenarios, and the implications of its real-time communication capabilities. As we embark on this examination, the goal is to provide a comprehensive understanding of how this innovative robotic system may contribute to the advancement of disaster response technologies and potentially save lives in critical situations.

III. DESIGN

In the aftermath of natural disasters, the timely detection and rescue of survivors play a critical role in minimizing casualties. However, the search for live humans in disaster-affected areas is often hindered by the complexity of the terrain, time constraints, and the risk involved for rescue personnel. This project proposes an innovative solution to address these challenges: a WiFi-controlled robot equipped with a Passive Infrared (PIR) sensor, designed to navigate unmanned disaster-stricken regions and expedite the detection of survivors.

In disaster-stricken areas, the challenge of swiftly rescuing survivors is often compounded by the time-consuming process of searching for live individuals amidst debris and hazardous conditions. This project introduces an innovative solution in the form of a WiFi- controlled robot equipped with a Passive Infrared (PIR) sensor. The primary goal is to expedite the detection of live humans in unmanned disaster zones, where traditional search methods are impractical. The PIR sensor, the central component of the system, identifies infrared radiation emitted by living beings, providing the robot with the capability to pinpoint survivor locations. A PIC microcontroller processes signals from the PIR sensor, triggering a buzzer alert upon detecting live humans and signaling the need for urgent attention. The robot's movement is facilitated by a motor setup with two DC motors, ensuring agility in navigating challenging terrains.

The integration of a WiFi module enables remote control and real-time monitoring of the robot's movement over the Internet. By combining advanced sensor technology, intelligent microcontroller processing, and remote operability, this WiFi-controlled robot aims to significantly improve the efficiency of search and rescue operations, ultimately contributing to the timely and effective rescue of a greater number of lives in disaster-affected areas.

Use Case Diagram:

Creating a use case diagram involves identifying actors and use cases to represent the interactions within a system. In the context of the WiFi-controlled robot for disaster rescue, the key actors are typically the "User" and the "Robot.

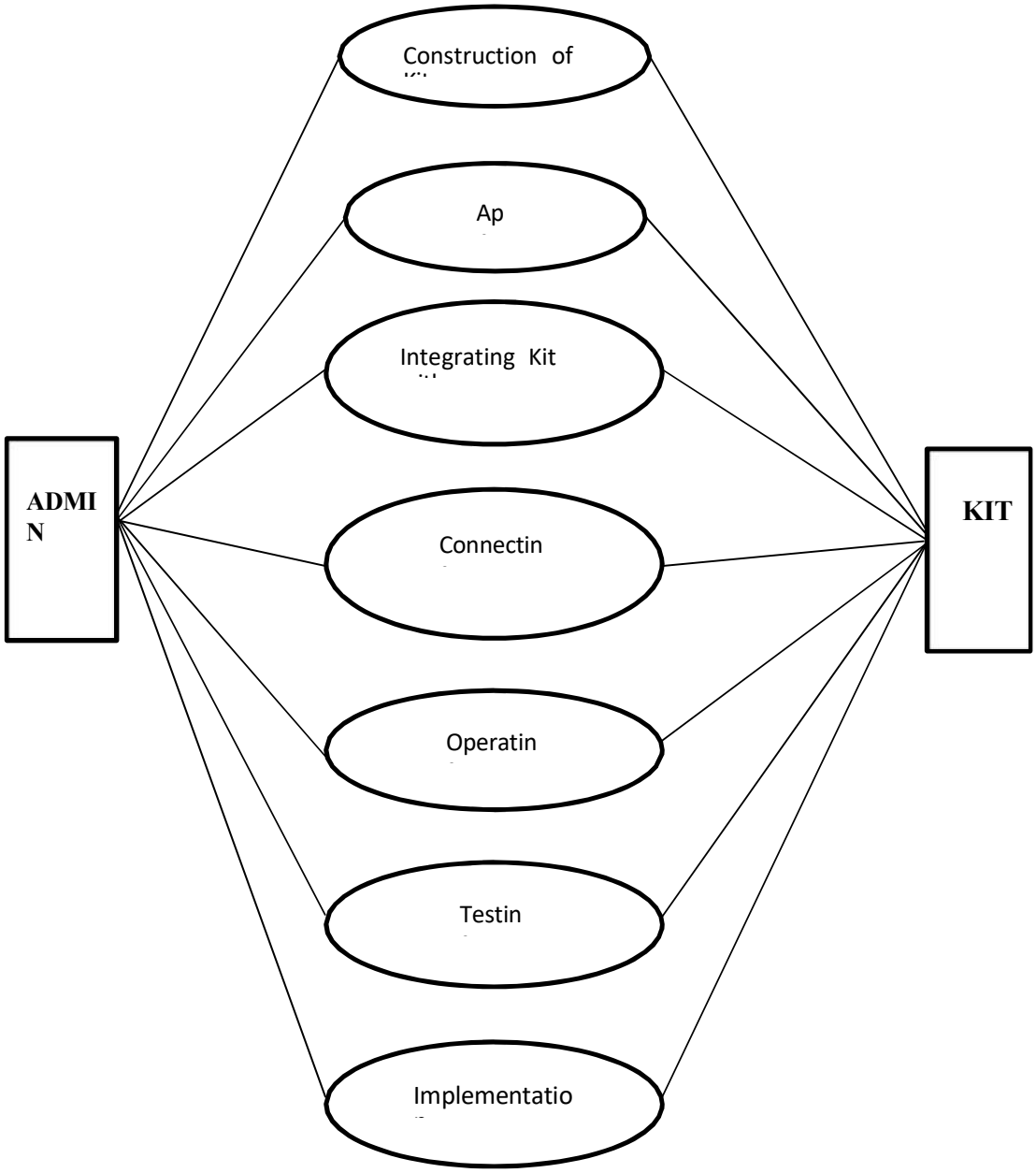

Fig 4.2.1 Use Case Diagram

Class Diagram:

A class diagram provides a static view of the system, depicting classes, their attributes, and relationships. In the context of the WiFi-controlled robot for disaster rescue, the following class diagram outlines the essential components and their associations

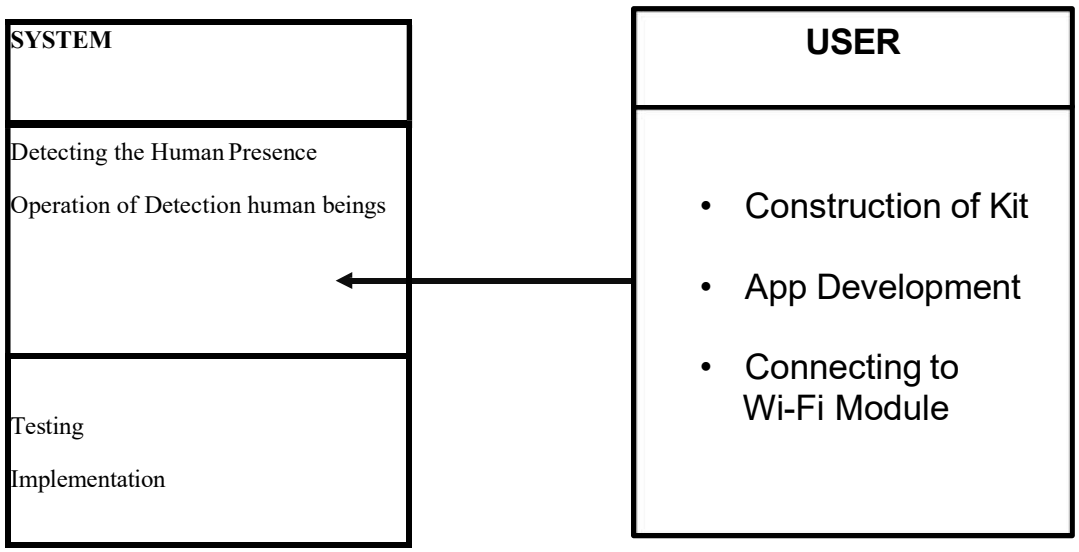

Fig 4.2.2 Class Diagram

Deployment Diagram

A deployment diagram in UML showcases the physical deployment of artifacts on nodes (hardware or software elements).

Fig 4.2.3 Deployment Diagram

Sequence Diagram

A sequence diagram in UML illustrates the interactions between different components or objects in a particular sequence.

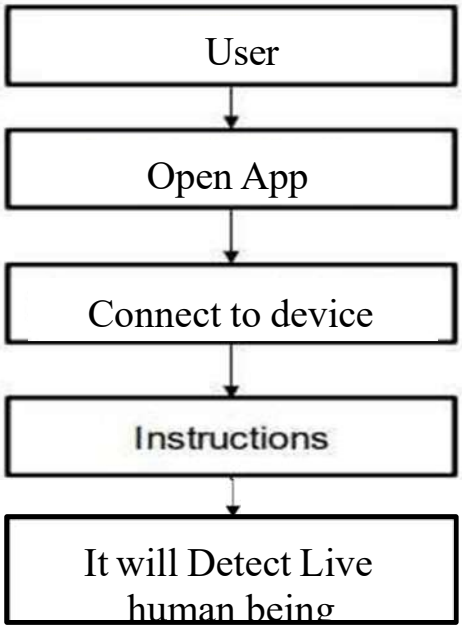

Fig 4.2.4 Sequence Diagram

IV. Result & Output Screens

Fig 5.4.1

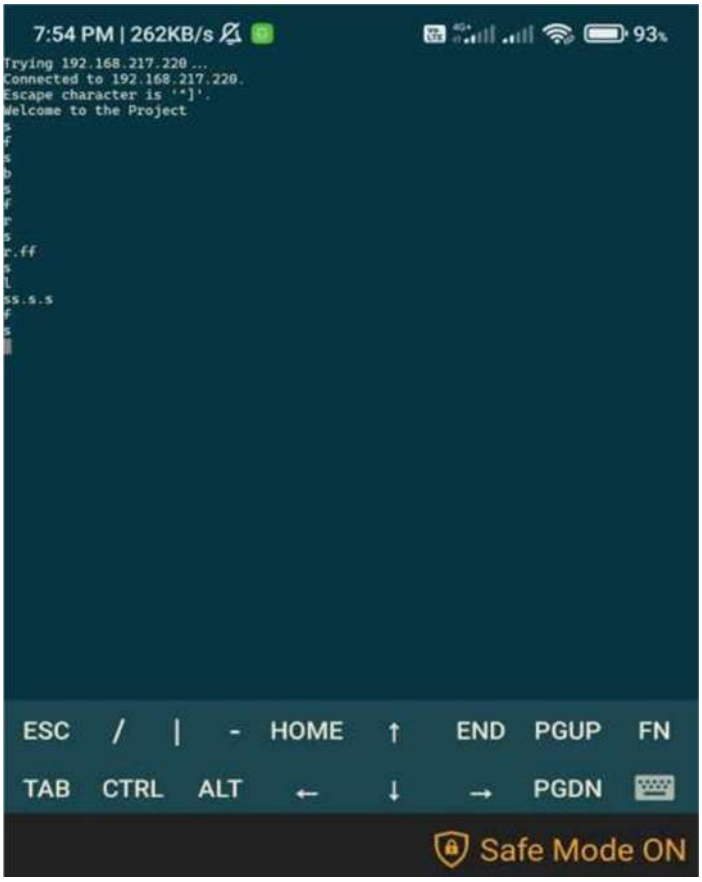

Fig 5.4.3

In the above picture it specifies the dashboard off the application and the paired devices of it.

The above figure when the user it connected to ESP2866 Wi-Fi module.

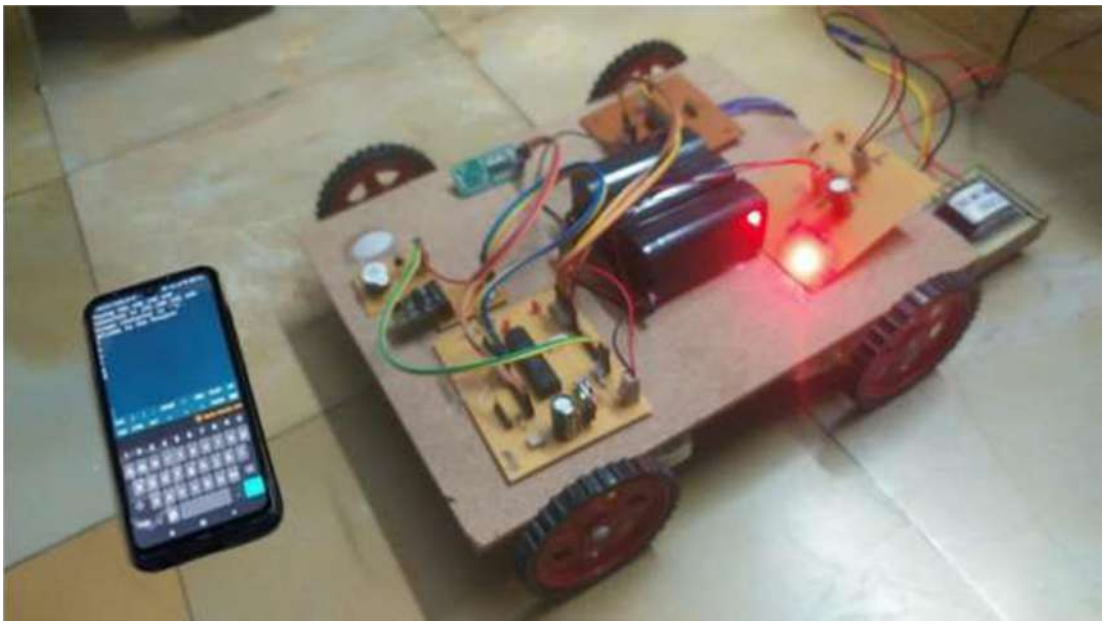

Fig 5.4.3

The above figure when the user it connected to the Mobile phone device.

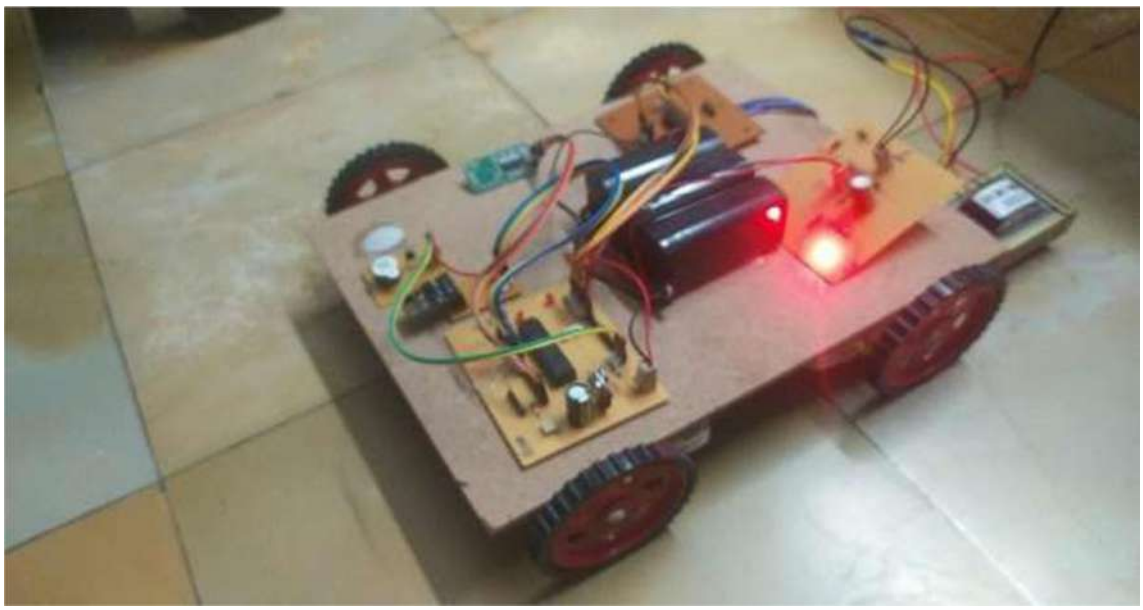

Fig 5.4.4

The above figure when the user it connected to the Mobile Phone device and selected as Auto and the kit is under the area where the light is not required(depends up on the location)the kit gets sensed automatically When there is Human presence.

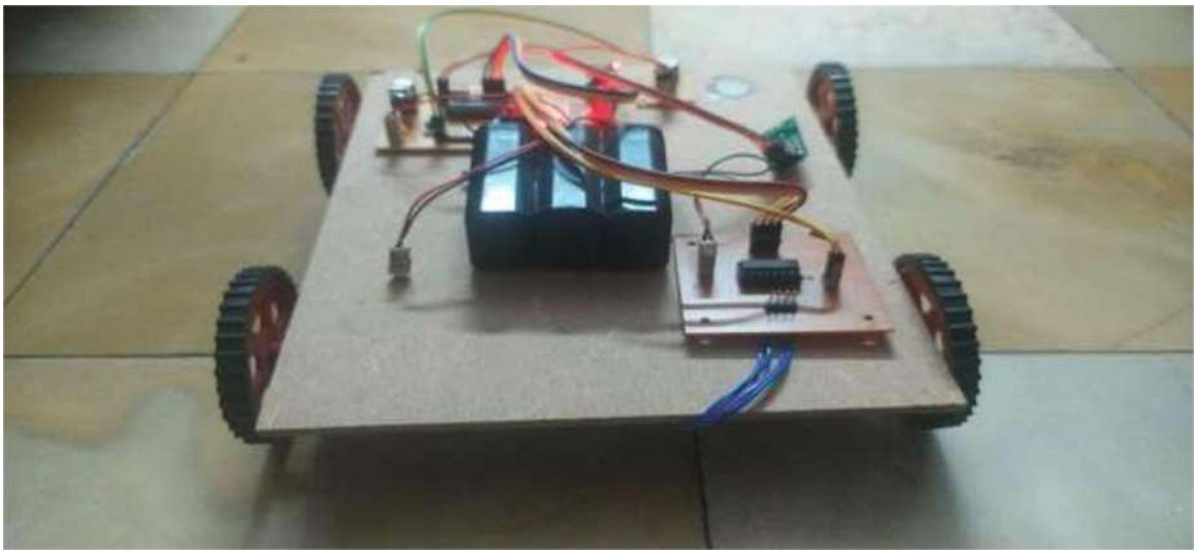

Fig 5.4.5

The above figure when the user it connected to the Mobile app and the kit is under the presence of light or dark area and no additional light is required.

Result Analysis

This chapter provides information about the website's implementation phase. This section provides a succinct overview of the key features that were used to develop the URL checking application. It is made up of numerous source codes that were used to create this website. Additionally provides the results of each area, which clarifies the various possibilities available to correctly finish project**.**

V. Conclusion

Integrating features of all the hardware components used have been developed in it. Presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. Secondly, using highly advanced IC's with the help of growing technology, the project has been successfully implemented. Thus the project has been successfully designed and tested.

Future Enhancement:

Our project "**Live Human being detection Wi-Fi controlled Robot**" is mainly intended to detect humans by a robot. This project has a PIR sensor, WI-FI to control the robot wirelessly and a robot which are interfaced to the PIC micro controller. The PIC micro controller is programmed in such a way that the robot can be operated using WI-FI technology and the PIR sensor detects any human presence in its way and if any human

presence is being detected it gets on an alarm system. This project can be extended using Zigbee technology, which increases operating wireless distance. Also a video camera can be used get the photos of the person being detected. In future we can use this project in several applications by adding additional components to this project. By connecting wireless camera to the robot, then we can see the outer world from our personal computer only by using GPRS and GPS. We can use this robot at so many fields and we can use to handle so many situations. By connecting bomb detector to the robot, we can send it to anywhere i.e (battle field, forests, coal mines, to anyplace) by using our personal computer and we can able to detect the bomb at field, here sensor detects the bomb and gives information to micro controller and it gives the information to transceiver and it sends the information to the personal computer.

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