

# Internet Controlled Robotic System Using Raspberry Pi

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**ABSTRACT:** In the recent years, the increasing use of wireless applications and the demand for a system that could easily connect devices for transfer of data over a long distance without cables became worldwide. This project presents the Build and interface of a real time wheeled mobile robot installed above it an arm and a camera. Software system can be built in three various programming languages and controlled via the internet using webpage protected with a username and password to make sure it cannot be hacked. The webpage is designed to control the mobile robot remotely through the internet by any web browser such as Mozilla Firefox. Camera is mounted on the animated base in two axes in order to have better visibility. The designed mobile robot can be remotely operated from everywhere around the world without being near the robot. It can be controlled by using any device, whether a laptop, a mobile or a tablet. It can move forward, reverse, turn right and left for a specific distance according to the controller specification. The mobile robot system is used to transfer foreign objects and access to areas that are unable to be accessed by humans. It is also used for purposes of monitoring to fit a camera. The development of this robot is based on linux platform which will be interfaced with the microcomputer that is placed on the robot running as a server. After completing the design and testing the robot, this prototype of the robot is expected to solve many problems such as placing or picking objects that are far away from the user, picking and placing hazardous objects in the fastest and easiest way.

**KEYWORDS:** Internet of Things [IoT], Raspberry Pi, Raspberry Pi, LINUX Platform,

## I. INTRODUCTION

. The technologies being developed today are mainly focused in controlling and monitoring different activities. Most of these technologies are focused on efficient monitoring and controlling of different activities through a common platform. An efficient robotic system to monitor and perform physical functions that are difficult for human beings to perform. When devices like sensors, arms, micro-computers become self-efficient, the system is termed as smart devices. In this particular paper, we have used LINUX platform to code the system requirements. The automated system comes of help in many applications including monitoring, performing pick and drop operations. It could also be modified to be used for defense practices. The robotic system uses a micro-computer to control the entire system. This reduces the risk of having independent functioning system in a dependent platform. Also, this paper helps in making the system used an effective one by reducing the size of the physical system to a considerable rate. This is the most important advantage of this project. Also, one can easily access the system from anywhere around the world without having to be present physically around the system. Once coded, the system is password protected and can be accessed only by specific users who are authenticated. We can use the system to create a virtual recording scenario to engage the system and record video outputs. In the current scenario, these kind of systems are preferred because they reduce the human power needed to implement a function. In the initial days, everyone had to go around the world, including remote areas, to access the required parameters.

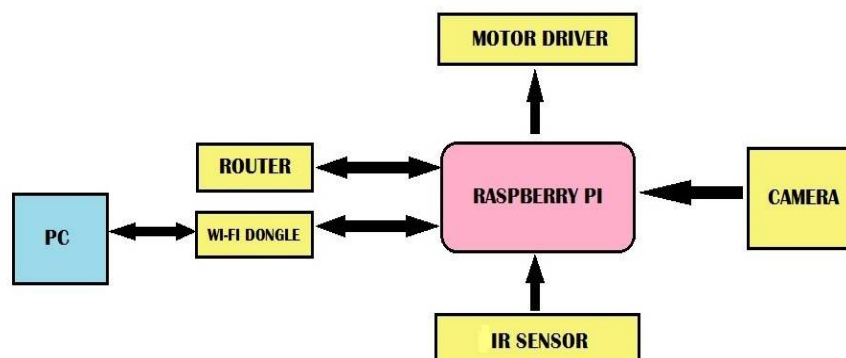
## II. RELATED WORK

In the recent years, the increasing use of wireless applications and the demand for a system that could easily connect devices for transfer of data over a long distance without cables became worldwide. This paper presents the Build and interface of a real time wheeled mobile robot installed above it an arm and a camera. Software system can be built in three various programming languages and controlled via the internet using webpage protected with a username and password to make sure it cannot be hacked. The webpage is designed to control the mobile robot remotely through the internet by any web browser such as Mozilla Firefox. Camera is mounted on the animated base in two axes in order to have better visibility. The designed mobile robot can be remotely operated from everywhere around the world without being near the robot. It can be controlled by using any device, whether a laptop, a mobile or a tablet. It can move forward, reverse, turn right and left for a specific distance according to the controller specification. The mobile robot system is used to transfer foreign objects and access to areas that are unable to be accessed by humans. It is also used for purposes of monitoring to fit a camera. The development of this robot is based on Arduino Mega platform which will be interfaced with the microcomputer that is placed on the robot running as a server. After completing the design and testing the robot, time delay is calculated in different cases (LAN and WAN) network. Finally, this prototype of the robot is expected to solve many problems such as placing or picking objects that are far away from the user, picking and placing hazardous objects in the fastest and easiest way.

## III. PROPOSED SYSTEM

In the recent years, the increasing use of wireless applications and the demand for a system that could easily connect devices for transfer of data over a long distance without cables became worldwide. This paper presents the Build and interface of a real time wheeled mobile robot installed above it an arm and a camera. Software system can be built in three various programming languages and controlled via the internet using webpage protected with a username and password to make sure it cannot be hacked. The webpage is designed to control the mobile robot remotely through the internet by any web browser such as Mozilla Firefox. Camera is mounted on the animated base in two axes in order to have better visibility. The designed mobile robot can be remotely operated from everywhere around the world without being near the robot. It can be controlled by using any device, whether a laptop, a mobile or a tablet. It can move forward, reverse, turn right and left for a specific distance according to the controller specification. The mobile robot system is used to transfer foreign objects and access to areas that are unable to be accessed by humans. It is also used for purposes of monitoring to fit a camera. The development of this robot is based on linux platform which will be interfaced with the microcomputer that is placed on the robot running as a server. After completing the design and testing the robot, this prototype of the robot is expected to solve many problems such as placing or picking objects that are far away from the user, picking and placing hazardous objects in the fastest and easiest way.

### BLOCK DIAGRAM



In the above block diagram representation of the proposed system, we find that there are different components being controlled by a single component, namely raspberry pi.

There is a central control implemented on the motor, camera, and the router device components.

The two sections present are as follows:

1. One for the server section and
2. Another for controller section.

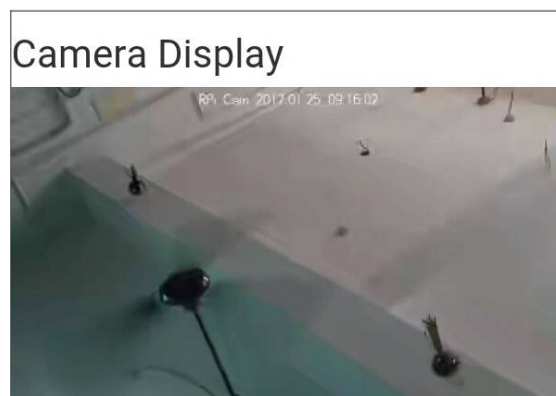
The raspberry pi is used to provide an interfacing medium between the server section and the PC section through a wireless connection protocol.

#### IV. EXPERIMENTAL RESULTS

The final output of the proposed system give a webpage designed specifically for the user's purpose. Also, a camera module is fixed for live recording sessions when required.



In the above webpage design, we can find that there directions provided. These symbols appropriately prompt the robotic system to move in the desired directions. This may vary from field to field. Once clicked, the system loads the robot to move in that particular direction.



The camera output is a live recording system that can be used to view the processes happening on the other side where the system is placed. This camera module is of 5MP configuration and can be used to capture images and record even distant objects if required.

#### V. CONCLUSION

Using this system, we can conclude that the controlling of the robotic system need not be performed using a physical presence. With the proposed system, we can perform all the required functions from wherever we want. Also, we can have a live recording session implemented if we require from anywhere around the world. The

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future enhancements of this paper can be done in many different methodologies. One can use an advanced raspberry pi system when implemented in large scale producton.

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