Smartphone controlled Robotic Application using IOT

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Abstract: Internet of Things (IOT) has grown rapidly over the few years. The function of IOT is to take different values from different sensors which are connected to various hardware equipments and thereby connecting it to the network. In this review paper, it mainly focuses on the importance of IOT in robotic application as IOT allows massive number of uniquely addressable "things" to talk with each other and transfer data over existing internet or compatible network protocols. Along with hardware developments 5G internet technology is also getting developed rapidly. In order to appreciate this wide development in IOT it should be use to connect as many objects in future. It also becomes easier to monitor and control which is further discussed in the paper

Index Terms - **Internet of Things (IOT), robotic application, monitor and control, 5G internet**

I. INTRODUCTION

Internet of things mainly deals with connecting different devices with the help of internet and making them interact with each other and the server with the evolution of IOT much larger amount data can be transferred between various things and the server as due to large amount of data transfer it requires continuous high speed internet. "with 5G technology, getting and staying connected will get easier ",said Aicha Evans, Intel's corporate Vice-President and general manager of communication and devices group[2] later on with the evolution of 5g technology many things can be connected thus making IOT efficient, faster and effective[2]. IOT is working with 3g and 4g internet because the devices which are connected are very few. IOT is used to detect the various parameters of hardware equipments used for industrial application and thus help in giving proper ideas about the breakdown. On the other hand it is used in pharmaceutical companies, to keep database of body functionality[3]. The current studies are progressing towards robotics field which makes use of internet thus giving birth to a new term "Internet of Robotics". The use of IOT in robotic applications is to reduce the human intervention and simultaneously the communication of human and robot. The robots are classified into two categories the industrial robots and the domestic robot like the humanoid robot[4]. This paper mainly focuses on using IOT in industrial robots.

II. RESEARCH METHODOLOAGY

1. Background Overview

A. Remote controlled robot using Android mobile device.

(IEEE 2014 authors:- Ian Nodvornik, Pavel Smutry)

This paper potrays the cellular phone application for different android operations; In this project the mobile is controlled manually which uses the wireless Bluetooth technology. The interaction of robotic application is dome through a display, which consist of a graphical interface. The current distance of the robot is measured through ultrasonic sensor which is included in the hardware of Robot; along with this a prototype is also included in the mobile for various applications.

B. Bluetooth communication controlled robot based on gesture recognition.

(IEEE 2015, authors:- Rahul kumar singh, Archisman Sarkar, Debashish Chakravarty, Paritosh Goyal, Vaibhav Lodhi, Anurag Sharma)

Gesture recognition is a topic in computer science and technology with the goal of interplay the results of user application. Today robotic field is being exploded in various aspects of possible application in gesture recognition. In this paper gesture recognition tool has been used to control the robotic movement and arm pair has gripping the object of internet using Bluetooth module for this an android application algorithm has been developed which gives an interactive user interface where the user will fit the smart-phone in the direction of desired movement and design of it decides the speed of robot. The application uses smart phone inbuilt accelerometer, programmer and Bluetooth as a processing unit and data transmitted. By during so the user has flexibility to control the speed as well as directions of robot consist of a pair of grippers such can be controlled using gesture outputs for holding any object of interest.

2. **Block Diagram.**
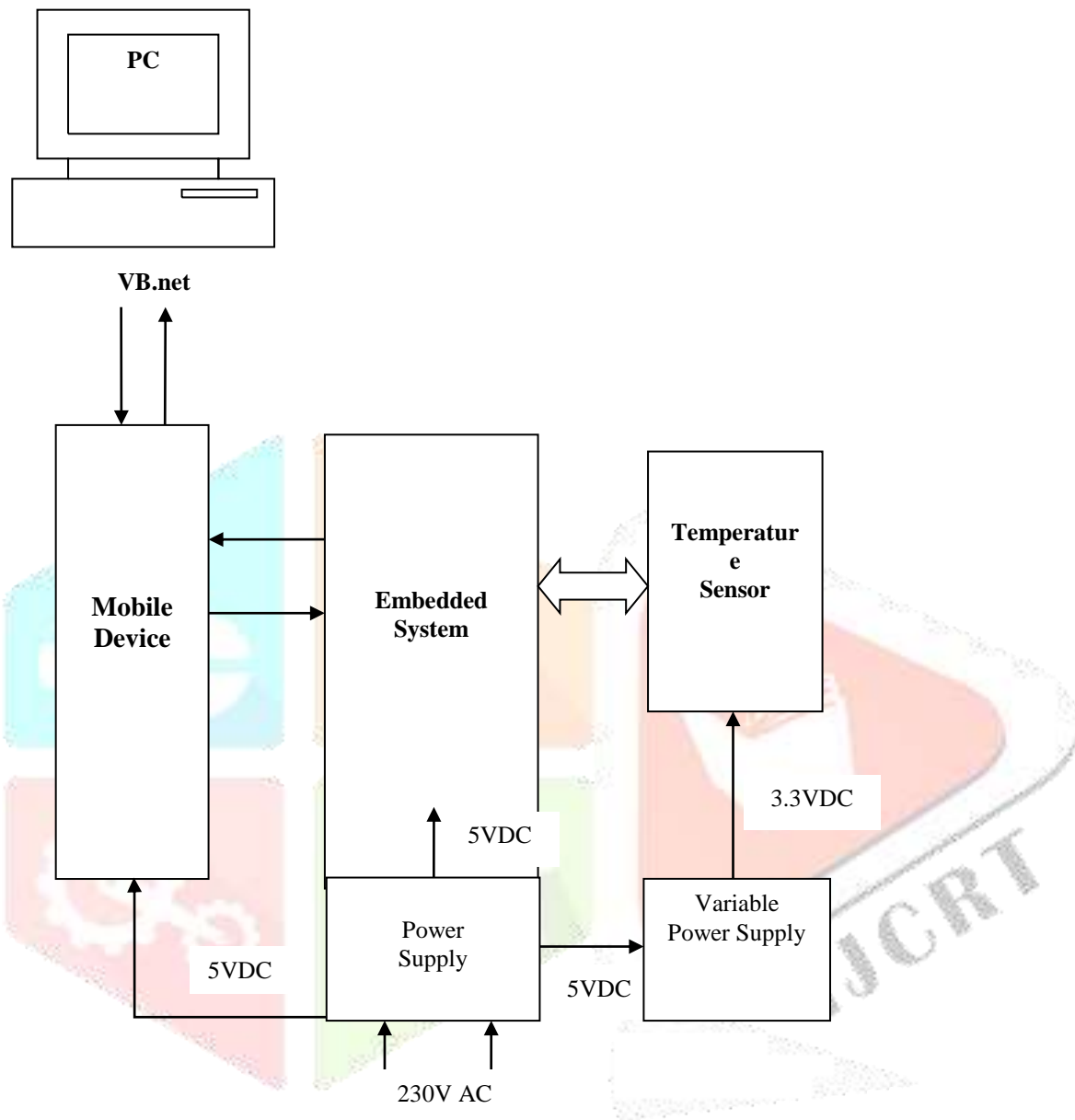
Proposed System:

In this project we are mainly using ARM7 and HC05 bluetooth module. The use of ARM7 in this project is very vital and important as it connects all the peripheral devices in the system, and the embedded program used in ARM7 is the main part of the project as it contributes to the main function of the robot. The second component is HC05 bluetooth module which is a serial port protocol used for transparent wireless serial connection with the help of these component we built a robot, along with tis we implemented IOT through which the robot can be controlled wirelessly and can be monitored wirelessly from any corner in the world
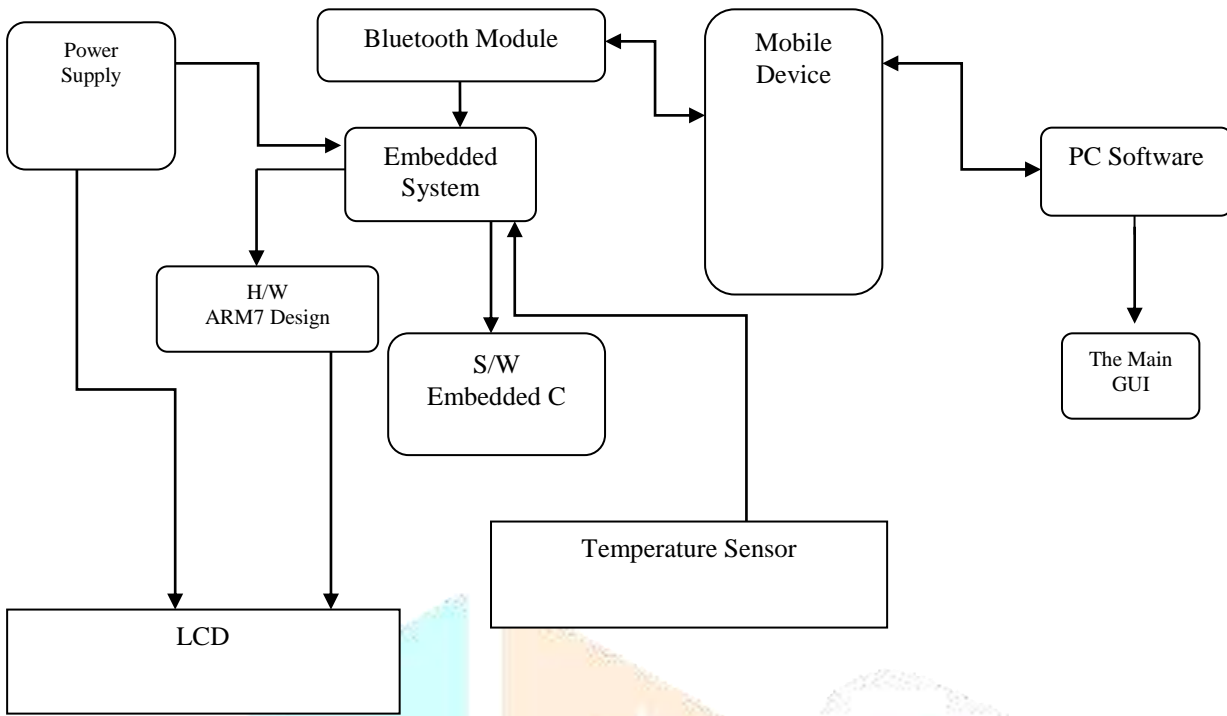
3. Working principle.

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- The working of this project depends on various factors such as the programming part and the hardware part.
- The hardware of this project is developed by using ARM7, Bluetooth module(HC05), power supply, mobile phone(Android) and a laptop.
- Basically a smart phone is placed or included in the Robot which receives command from the laptop through IOT (Internet of Things) and then the command from the smart phone is passed into the Robot with the help of ARM7.
- The command in which the Bluetooth module(HC05) acts as a mediator to pass commands from Bluetooth to ARM7.
- The program used for the ARM7 part is embedded C and for mobile, we are using Java and for the laptop section we are using C-sharp which is executed in VB.net software.
- The program of C-sharp is developed in such a way that, it also predicts and evaluates the temperature of the area where the robot is present.
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4. Enhancements

A. Advantages
- Real time location through GPRS.
- Temperature sensor for detecting ambient temperature.
- PC controlled movement via IOT.

B. Future modifications
- A CCTV Camera can be installed in the robot, as it is used in pharmaceutical companies, we get an idea about any leakage of chemical in that particular area where robot is present.
- We can add voice announcement system in the robot so that any person present in the vicinity can be aware about any chemical leakage if present.

III. CONLCUSION

In order to implement IOT in the field of robotic application it is mandatory to understand about the pros and cons of various application and tasks performed by the robot. It should also be taken into consideration that he sensor attached to robots such as temperature sensor, accelerometer should be successfully connected. It also includes MQIT protocol for communication which is considered as stable protocol for IOT. The various parameters used in the project in designing the hardware and the programming

language should be properly selected, taking into consideration the use of application which is desired for the robotic application controlled through IOT.

IV. ACKNOWLEDGMENT

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