

## Mobile Controlled Robots

*K.Kanimozhi, S.Viswanathan*

*PG Student*

*Department Of Computer Application  
IFET College of Engineering*

*Associate professor,  
Department of Computer Applications,*

*IFET College of Engineering*

**Abstract:** *Conventionally, Wireless-controlled robots use rf circuits, which have the drawbacks of limited working range, limited frequency range and the limited control. Use of a mobile phone for robotic control can overcome these limitations. It provides the advantage of robust control, working range as large as the coverage area of the service provider, no interference with other controllers and up to twelve controlles.*

*The key function of these robots is their ability to communicate with humans. Since communication via mobile phones is becoming increasingly common among us, it is essential for these robots also to be able to communicate using mobile phones. In this paper we propose the concept of a home robot and describe the essential functions that we consider are essential for the robot.*

*Although the appearance and the capabilities of robots vary vastly, all robots share the feature of a mechanical, movable structure under some form of control. The Control of robot involves three distinct phases: perception, processing and action. Generally, the preceptors are sensors mounted on the robot, processing is done by the on-board microcontroller or processor, and the task is performed using motors or with some other actuators.*

**Keywords:** *robots ,twelve controlles, microcontroller, sensor, perception.*

### INTRODUCTION

Fujitsu Laboratories has developed a home robot capable of being controlled by, and sending video images to, a mobile phone .



. Fig 1.Video image

The vacuum cleaner-size robot is capable of traveling around an apartment or house (it cannot climb stairs) to perform tasks such as monitoring a particular spot, like an

entrance hallway, or checking on a pet. The robot can perform such tasks on demand, with the user sending commands from a cellular telephone handset and watching the video signal from Maron-1's built-in cameras, or the robot can be programmed to contact the user via telephone when an event occurs, such as when it detects movement in a hallway

The demonstration system consists of internet connection, home automation devices and networks, home robots, and user interface devices.

Mobile robots can be useful in many ways in homes and offices. For example they can be used for monitoring and measuring the environment, they can act as a user interfaces to an automation system or as a moving communications platforms. Some robots are already in the market. These existing robots are mainly for entertainment such as the Aibo from Sony, for mowing the lawn.

Indoors robots can best be utilized in an intelligent environment, which comprises of home automation networks, connected sensors, actuators and other devices.

Indoor service robots use the local network to exchange information and controls with the other connected devices. A remote user can connect to the local network to retrieve data and to control the robot and other devices in the network. In this type environment effective remote interaction with the service robot can be implemented by utilizing virtual models and augmented reality. The developments in home automation are paving the way to home robotics. The home server and gateway technologies are important, because home robots will communicate with the outside world through these gateways.

## 2.OBJECTIVES

To build such a system various technologies needed to be investigated. The demonstration system was to be built using wired and wireless home networks, mobile robots and a home server computer with an Internet connection. The functions of the system are:

- \* Various user interfaces: mobile robot, mobile phone, indicator lamps and alarms
- \* Mobile robot looks for a person, displays a message, and waits for a acknowledgement
- \* Monitoring the kitchen stove
- \* Informing of incoming mail
- \* Reminding to take keys when leaving the house
- \* Measuring of the activity level of the inhabitant using multiple IR motion detectors in every room
- \* Communication between home and outside

The main features of the system are:

- \* Two-way communications system between people and equipment at two distant locations over Internet
- \* Video and voice communications
- \* Augmented reality user interface
- \* Use of virtual models in navigation and path planning
- \* Teleoperation of cameras, robots and other devices over networks
- \* Access and sharing of documents and data
- \* Data collection, storage, management and distribution of the measured data

The central technologies needed to develop the system are the following:

- \* Video conferencing
- \* Home automation and home automation networks
- \* Emerging standard "home gateways"
- \* Mobile home robots
- \* Virtual models and augmented reality
- \* Positioning system for robots, people and equipment

## 3.AN OVERVIEW ABOUT THE ROBOTS

3.2 Ball shaped robot – Rollo



Fig. 2.Overviews image

Robot has a spherical transparent cover. It moves forward and backward by moving its internal drive unit (IDU), displacing its center of gravity. When the rim that attaches the cover halves to the IDU is horizontal, it can change its direction. When the rim is in vertical position, it can move sideways. The energy source is a NiCd battery, which provides power for up to a couple of hours, depending on the use of its electrical drive motors, screen, camera and radio devices.

The robot is controlled by a microcontroller (Phytec MiniModul-167 using Siemens SAB C167 CR-LM micro controller). For visual and audio perception the robot is equipped with a camera and a microphone and a video link. The camera can be tilted +-100 deg. When it points upwards it is used for detecting visual landmarks in the ceiling. For communication with the server, a Bluetooth chip is used. The robot has sensors for temperature, pan, tilt and heading of the inner mechanics, and pulse encoders in the drive motor. The software is written in C language.

Robot can be controlled by either sending commands through the Bluetooth radio or by using an infrared remote controller. The commands include turning for a certain number of degrees, running for a certain distance, using the

auxiliary devices and displaying messages and graphics on the screen.



Fig.3.Sample image

#### 4. CONSTRUCTION



Fig.4.Mobile phone robot

In this the robot, is controlled by a mobile phone that makes call to the mobile phone attached to the robot in the course of the call, if any button is pressed control corresponding to the button pressed is heard at the other end of the call. This tone is called dual tone multi frequency tone (DTMF) robot receives this DTMF tone with the help of phone stacked in the robot The received tone is processed by the atmega16

microcontroller with the help of DTMF decoder MT8870 the decoder decodes the DTMF tone in to its equivalent binary digit and this binary number is send to the microcontroller, the microcontroller is preprogrammed to take a decision for any give input and outputs its decision to motor drivers in order to drive the motors for forward or backward motion or a turn. The mobile that makes a call to the mobile phone stacked in the robot acts as a remote. So this simple robotic project does not require the construction of receiver and transmitter units.

DTMF signaling is used for telephone signaling over the line in the voice frequency band to the call switching center. The version of DTMF used for telephone dialing is known as touch tone . DTMF assigns a specific frequency (consisting of two separate tones) to each key s that it can easily be identified by the electronic circuit. The signal generated by the DTMF encoder is the direct al-gebric submission, in real time of the amplitudes of two sine(cosine) waves of different frequencies, i.e. expressing 5 will send a tone made by adding 1336hz and 770hz to the other end of the mobile. The tones and assignments in a dtmf system shown below.

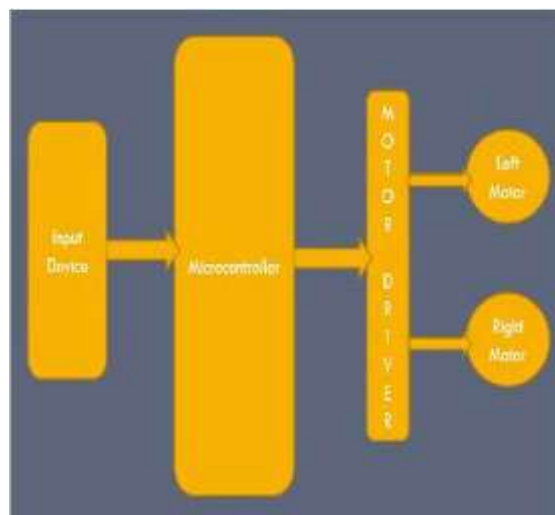
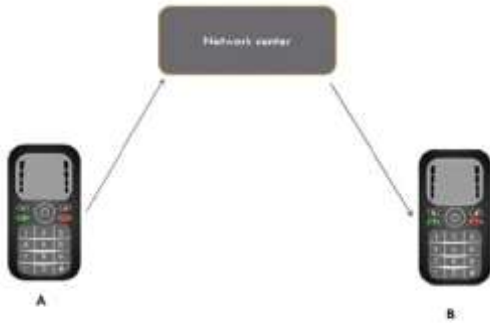


Fig.5.Workflow

#### 5. WORKING

In order to control the robot, you have to make a call to the cellphone attached to the robot from any phone. now the phone is picked by the phone on the robot through autoanswer mode(which is in the phn, just enable it). now when you press 2 the robot will move forward when you press 4 the robot will move left when you press 8 the robot will move backwards when you press 6 the robot will move right when you press 5 the robot will stop.

Fig.6.Controlling system



## 6. SERVICES

### 6.1 Mail Alert :

The mailbox outside the demonstration apartment is fitted with a pair of optical proximity sensors that can sense any mail put in the box. The sensors are connected to the automation system. When new mail arrives, the Mail alert checks, where the user was detected last and sends the robot there. The robot will inform the user of the mail with a message screen and a sound.

### 6.2 Key Alert :

Key Alert uses a magnetic switch on the front door, a movement sensor, a switch for a key ring and a buzzer. It uses simple logic to reason when the user is coming home or going out. Key Alert appropriately reminds about placing the key in its place when coming home or taking it when going out. The user can be reminded with a buzzer sound and a light by the front door, with the home robot and a SMS message.

### 6.3 Activity Alert:

Multiple IR motion sensors generate signals when people are moving about in the apartment. Simplest way to use this signal is to determine person's position by detecting where he has last moved. This data can also be used to determine the activity level of the person or persons living in the apartment. Alarms can be generated, if the activity is abnormal.

## 7. CONCLUSION

"This robot has three main uses,". "The first is for home monitoring. Users can see what is happening in their house. The second is to control appliances, such as television sets and air conditioners, and the third is to monitor and alert the owner if anything is happening." Since they aid in automation it is believed that robots will rule the future world with its new inventions in technology.

## 8. REFERENCES: