



Smart Surveillance Cum Pick and Place Robot

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ABSTRACT: The project is intended to develop pick and place robot also transferring live video. It can safely work due to monitoring. The robot is android application controlled for remote operation. At the transmitting end using android phone, commands are sent to the receiver to regulate the movement of the robot then to maneuver backward, forward and left or right. At the receiving end two motors are interfaced to the microcontroller where two for them are used for arm movement of the robot. The android application device transmitter acts as a far off control that has the advantage of adequate range, while the receiver end Bluetooth device is fed to the microcontroller to drive DC motors then forward motor driver IC for necessary work. Remote operation is achieved by any smartphone, with Android OS, upon a GUI based touch screen operation and also Store the live video.

KEYWORDS: Bluetooth Device, Raspberry Pi, IP camera, *Video Streaming*, Smart Phone, Attribute-Based Encryption.

I. INTRODUCTION

The robot is specially designed for surveillance purpose. The control mechanism is provided together with video transmission facility. The video transmission is practically achieved by high speed image transmission. Initially, the robot are going to be equipped with an Android smart phone which is able to capture the scenario ahead of it'll transfer the pictures to the server on which the user are going to be controlling and watching the live feed. Mobile robots are robots which have the power to maneuver around and interact with their environment and not just hinged to a specific place. There are many labs and research groups from various universities and industries which are completely dedicated on researching mobile robots, due to their immense potential and varied application in industry, military, security, and entertainment. This project is to style and develop an intelligence robot by using an micro-controller. In our project the robot is intended to maneuver automatically. The robot acts consistent with the command given by the program. It'll move all the direction like forward, reverse, right and left. The video and audio are observed at the control unit. For transmitting video, IP camera has been used. During this prototype project we design in such way that this robot is moved anywhere. This project is incredibly much useful within the places where a person's cannot go in to the places like ground canals, Smoke oriented caves, etc., and this project is incredibly much useful in such situations. A mobile robot may be a machine that's basically place or mounted on a movable platform. In today's world a lot's of fields use mobile robots. Many of the complex robots that we now see have originated from the simpler mobile robots.

There are many problem with this video surveillance such as inconvenient to carry, anomalies cannot be detected, picture is indistinct, and required more storage space for saving the surveillance. The greater attract because of its important applications in areas such as traffic monitoring, video surveillance, sign language detection. To overcome this , they need a modern security system , a kind of image acquisition system based on ARM and Linuxha designed. It has a processing system USB camera, LCD monitor and build necessary peripherals for communication to complete the hardware platform. The video can save and store the image for the review require for the administrators. They provide the internet access ,through cellular connection and Wi-Fi and enable for the new application. Now a days a video application is popular. We need to meet the growing demand of the video application in cellular networks.



Safety monitoring and protection system plays a important role in people lives. There are more effective and reliable method for the security monitoring and protection system. There is a saying called "seeing is believing" much amount of information in image than language so can be easily understood.

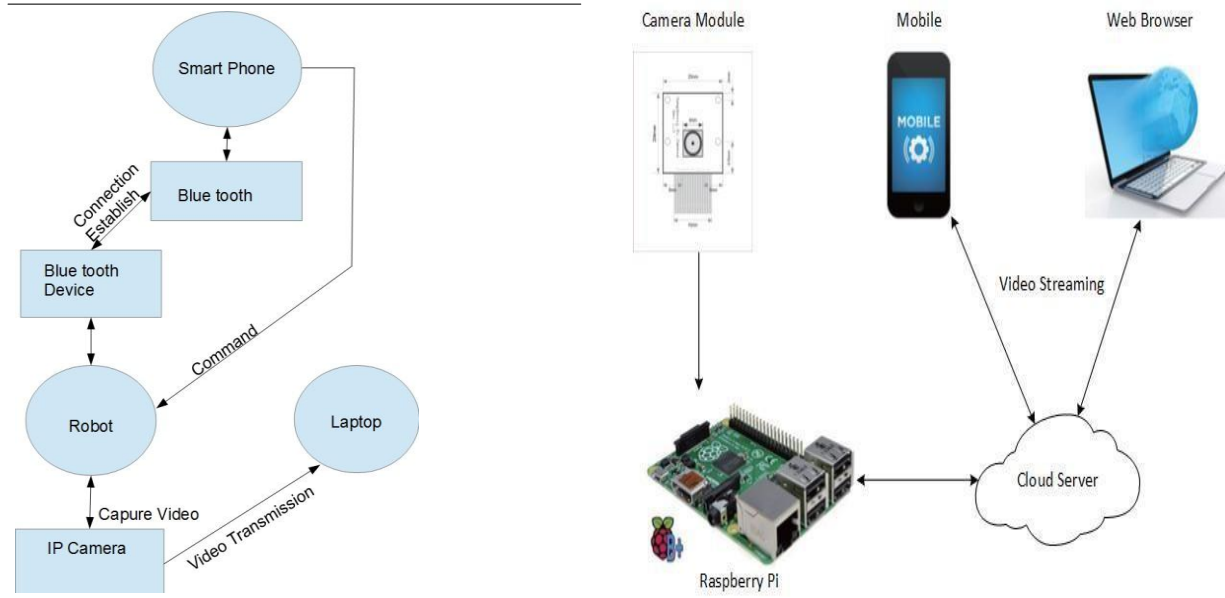


Fig.1: System framework

II. PROPOSED ALGORITHM

2.1 Attribute-Based Encryption Algorithm

The Attribute-Based Encryption (ABE) is one among the important approach which is helpful for Safe information extrication using DTNs (Delay Tolerant Network). The encryption technique is used for security purpose during which CP-ABE (Cipher text-policy attribute-based encryption) technology is used. The CP-ABE (Cipher text-policy attribute-based encryption) technology is one among the various and important technology. The data which is required that are taken in encrypted form by getting the key from the authority. There's Separate authority for group member and for key update same algorithm is used. The encrypted data is stored into storage node. From storage node, required information is ready to take by group member. There's one among the challenge during which co-ordination of the key authority is vital and user who are the holding account in that and during which previous the key escrow problem is exist and now this problem is overcome, in which all the key authority aren't ready to view the key of group members and in which particular key authority can see their own group members key and remaining key authority cannot view.

The next generation of surveillance will able to annotate video and coordinate the tracking of object with multiplexing hundreds of video streaming. Video surveillance has evolved over year and vital tool for safety. It has been initially dominant by the camera with coaxial cable and they connected using coax cables. There is a digital type of switching and IP based data delivery. They can capture the wide area so, the camera here we are using omnidirectional camera or mobile camera can also be used. Raspberry Pi used for core control, camera for capturing the video and user phone or laptop connected to WiFi to receive the live streaming videos. Here we use a new feature known as the router for routing the video stream to network.

Here we concept of the GMM algorithm for processing. GMM algorithm improves the foreground segmentation and reduce the processing speed. We implement this algorithm in some variable lighting condition. The probabilistic foreground to identify the possible foreground. With the development of technology like IT, there is a rapid development in a embedded of open linux system , video conferencing , remote monitoring and mass data processing field can apply to embedded technology. This technology has to overcome week points of traditional video surveillance such as poor stability and cost expensive. It has advantage of hardware and software which can be cut or compact and low power



consumption and used for the long distance transmission. Home security is fundamental these days of interruption and expanding step by step such as burglary, crude gas and fire are necessary for home security frame work. The GSM provide the improved security at any point of sensor happens.

EXISTING SYSTEM ARCHITECTURE

In conventional robotics, the controlling and operation of robots is sometimes done by using RF [Radio Frequency] circuits. These circuits are mostly used for control and dealing applications and are reliable over a low range. The RF circuits incorporates receiver and transmitter which are independent of each other. All the control signals and commands are sent to wireless medium in between receiver and transmitter There are a variety of benefits of RF circuits such as Low cost, simple design Construction, easy decoding, less maintenance cost etc. Be- sides these advantages, there are still many drawbacks of using a RF circuit in circuit. They are Limited Frequency Range: The frequency range used for RF communication is near about 3KHz-3GHz. The use of channel separator increases the reliability but decreases actual us- able working frequency range. Limited Functions: The limited number of channels causes less number of combinations and thus their are less numbers of obtainable functions. Limited Working Range: The working range of RF circuits with receiver and transmitter is incredibly small. The working varies from circuits to circuits, but mainly depends on the values of physical components utilized within the circuit. Reliability of Operation: The RF circuits are very prone to errors due to external conditions such as EMI, medium saturation, absorption due to repetitive reflections from surface. This could be a significant problem when working with scientific experimental components. Security Reasons: This is main disadvantage of using a RF circuit and the main reason why RF circuits are not preferred today. The RF frequency band is available for most of all the users for data communication. So there may be a scenario where over one user is trying to accommodate channel for its own communication. In such case the waveband may get interference from another user or worst case would be, some user intentionally trying to jam our communication network. The RF jammer circuits are very easy to design; hence the question of security arises when RF circuit is employed within the circuit. This security loop hole will be very dangerous when the robot is being employed for very confidential purposes. In areas of military these security threats can produce disastrous outcomes.

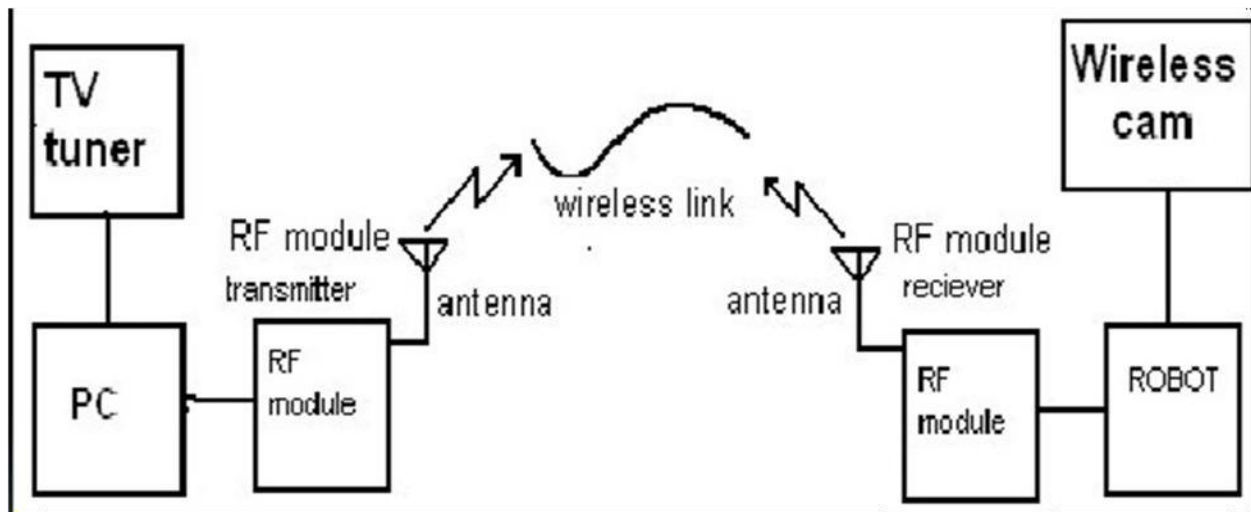


Fig.2. Existing System Architecture Diagram

PROPOSED SYSTEM ARCHITECTURE

The android application device transmitter acts as a distant control that has the advantage of adequate range, while the receiver end Bluetooth device is fed to the microcontroller to drive DC motors via motor driver IC for required work. Remote operation is achieved with Android OS by any smart-phone/Tablet etc., upon a GUI (Graphical User Interface) based touch screen operation. At the transmitting end using android application device, commands are sent to the receiver to manage the movement of the robot either to maneuver forward, backward and left or right etc. At the receiving end four motors are interfaced to the microcontroller where two for them are used for arm and gripper movement of the robot



while the alternative two are for the body movement.

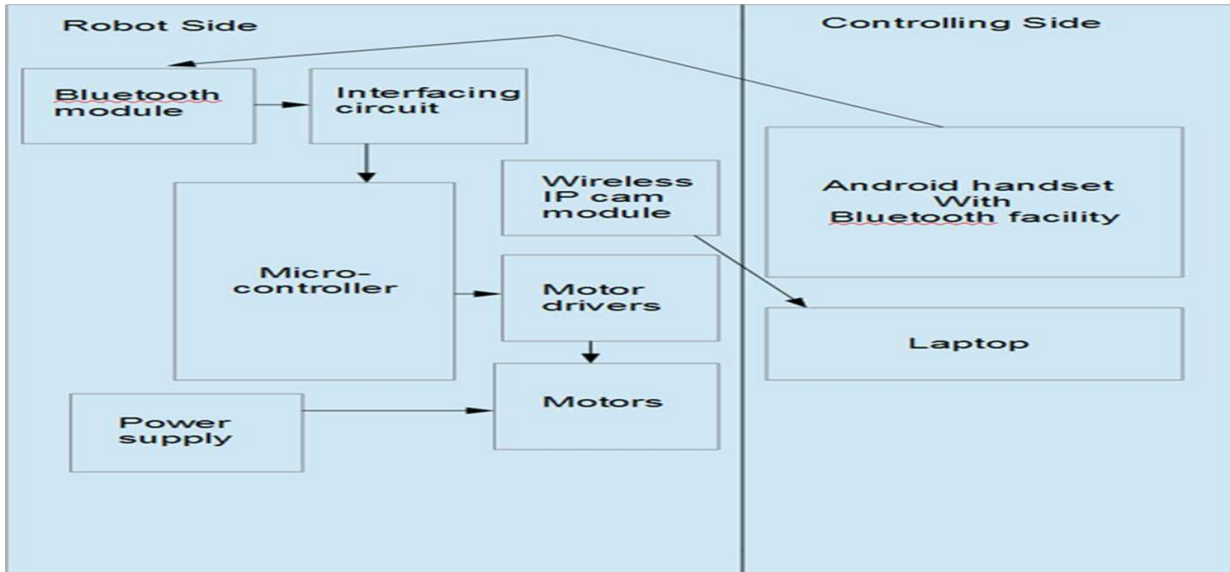


Fig.3. Proposed System Architecture Diagram

In this architecture we also use the camera module , Raspberry Pi device and connection among the devices to access video streaming. The camera module has been connected to the Raspberry pi board and be used for high definition video and still photographs. The Raspberry setup with a python script and which automatically deliver the video stream to cloud server. The user can see the video from the cloud directly on web browser or any android devices. The camera module has been connected to the Raspberry pi board and be used for high definition video and still photographs. The Raspberry setup with a python script and which automatically deliver the video stream to cloud server. The user can see the video from the cloud directly on web browser or any android devices.



Fig.4: Connection of Camera Pi board



Fig.5: Connection of Camera module on Raspberry

III. EXPERIMENT AND RESULT

The below presents the screenshots of the system. Here the control panel with control option to save the file which is used for capture of picture some change in video resolution. It analyse the incoming image and store important items, and here we can view the JPEG images and video will be played smoothly even we can watch on mobile with good reliable performance. While remotely can view in the 640x360 MJPEG image, the Raspberry Pi reports 67% CPU without overlocking.

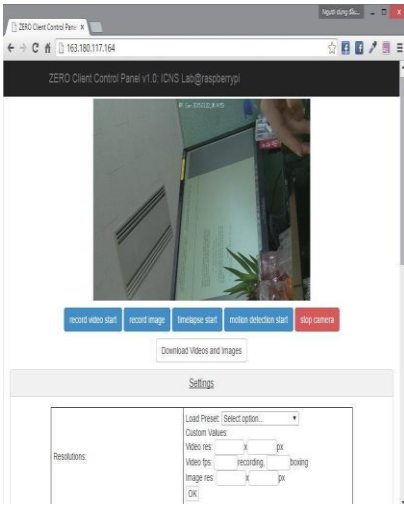


Fig.6: Monitoring Web Interface

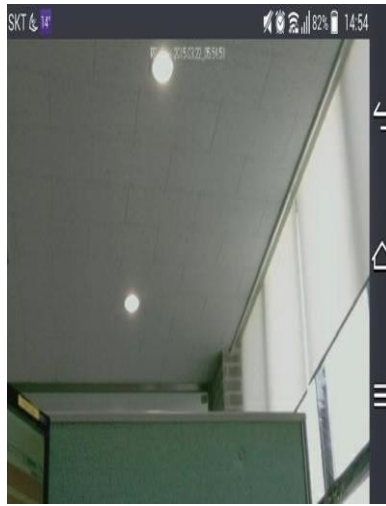


Fig.7 Interfaces on Mobile Devices.



Fig.8 Video Streaming

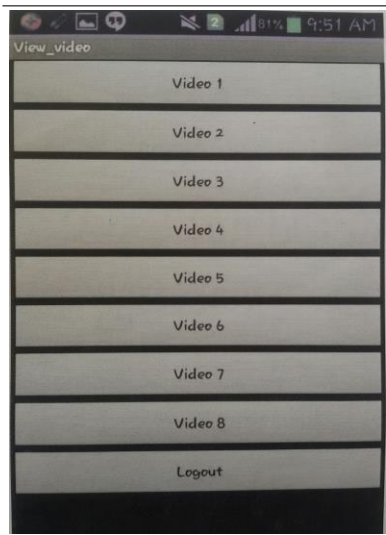


Fig. 9 Video storage list



ig.10 Bluetooth controller Architecture



Test Case Name	Input	Output	Description
Bluetooth Connection	Search	Join	First on the bluetooth & search the connect it
Command 1	I1	Left	Moves toward left direction
Command 2	I2	Right	Moves toward right direction
Command 3	I3	Forward	Moves toward forward direction
Command 4	I4	Backward	Moves toward backward direction
Command 5	I5	Pick	Pick the object
Command 6	I6	Place	Place the object

Table -1 Experiment Result

Table 1 show the command that given by mobile application to robot via Bluetooth connection according to that robot performs the action and give the actual output.

IV.CONCLUSION

In this paper, the system proposed the method to control both wireless communication between the mobile Robot and Android GUI Application. It gives versatile operation of robot controller which require not modify the hardware. The robot is designed and developed to move by command. It will move all the direction like forward, reverse, right and left. The video are monitored at the control unit.

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- And Fig. Video storage list