Android Controlled Spy Robot with Night Vision Camera

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ABSTRACT:An android is a powerful operating system and it supports large number of applications in Smartphones. Smartphones interacting with peripheral devices such as motors, servos and sensors led to the creation of electronic interface boards. These applications are more comfortable and advanced for the users. This robot can be controlled with the help an app of Android phones. This robot can move to any place and perform smartly within specified Wi-Fi range. So Android application sends the signal to RF receiver which is mounted on robot by using Wi-Fi connection. The robot consists of night vision wireless camera which can transmit images or videos. The main objective behind this project is to develop a robot to perform the act of surveillance in domestic areas. Nowadays robot plays a vital role in our day to day life activities thus reducing human labor and human error. Robots can be manually controlled or can be automatic based on the requirement. The purpose of this robot is to roam around and provide audio and video information from the given environment and to send that obtained information to the user. In this project, one can control the robot with the help of mobile or laptop through Internet of Things (IoT) and also can get the live streaming of video both in daytime as well as at night with the help of wireless camera from the robot. The robot can be controlled both in manual with the help of Raspberry Pi. This robot also uses various sensors that collects data and sends it to the raspberry pi which controls the robot behavior. Along with the obtained live streamed video output. Thus the action of surveillance can be performed.

KEYWORDS: Raspberry pi, GPS, Pi camera, DC Motor, Motor Driver, Power Supply

I. INTRODUCTION

Robotics is a widely developed technology in branch of engineering and science that includes Information technology, Mechanical Engineering, Electronic engineering, computer science and others. Robotics deals with the design, construction, operation, and use of robots, as well as computer systems for their control, sensory feedback, and information processing. This robot can work by smartphones over Wi-Fi which can be used to interface between Raspberry Pi and smartphone. In smartphone an Android app is used to send data to the Raspberry Pi that works on given instructions. In this system has a night vision camera is also used. Night vision camera have the ability to see in dark night. So videos can be monitored from anywhere through mobile phone. The security problem is resolved by video surveillance system. The design of our project encourages developing a robotic vehicle for the remote operation connected with the wireless camera mounted on the robot for monitoring purpose. The Android application consist of the push buttons that send the commands to the receiving module for controlling the movement of robot either to right, left, forward, downward.

A dedicated application is created to control an embedded robotic hardware. The application controls the movement of the robot. The embedded hardware is developed on Raspberry Pi and to be controlled by a Smart phone on the basis of Android platform. Raspberry Pi is to receive the commands from the Smart phone and takes the data and controls the motors of the robot by the motor driver L293D. The robot can able to move forward, reverse, left and right movements. The Smart phone has been interfaced to the device by using Wi-Fi. A wireless camera is mounted on the robot body for spying purpose even in complete darkness by using infrared lighting

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II.LITERATURE REVIEW

Mr. Rushikesh Ganesh Savarkar implemented Android Controlled Spy Robot With Night Vision Camera. The system developed will be easily controllable by an android Phone. The maximum range of Wi-Fi is 100 meters. The remote has 5 switches, one switch required for robot's specific action. The controlling actions of the robot is discussed as when user presses a specific key, the specific action related to the key pressed will be generated. The major application is that we can use android phones to control the robot from a remote distance. The robot that can be

controlled wirelessly through a remote from remote location connected with a wireless night vision camera. The camera can be useful for monitoring or spying operations even in darkness. The robot contains Raspberry Pi along with a series of sensors. The robot size should be small in order to perform spying operations very precisely and accurately. [1].

Sunita. S. Malaj Robot for War Field with Night Vision Wireless Camera by Android Application. In this the architecture of Wi-Fi module along with L293D motor driver IC. War Field robot can be used in Military Purpose and the Pi Camera can capture images in each direction by using Android app and the video will be recorded automatically [2].

Mr. Lokesh Mehta, Mr. Pawan Sharma implemented Android Controlled Spy Robot with Night Vision Camera it transmits images or Videos. The Night vision camera have the ability to see in dark night. The Android application consist of the push buttons that send the commands to the receiving module for controlling the movement of robot either to right, left, forward, downward [3].

III.METHODOLOGY

The previous chapter describes the details of literature survey on Android Controlled Spy Robot with Night Vision Camera using Raspberry Pi. This chapter describes the implementation of Android Controlled Spy Robot with Night Vision Camera using Raspberry Pi.
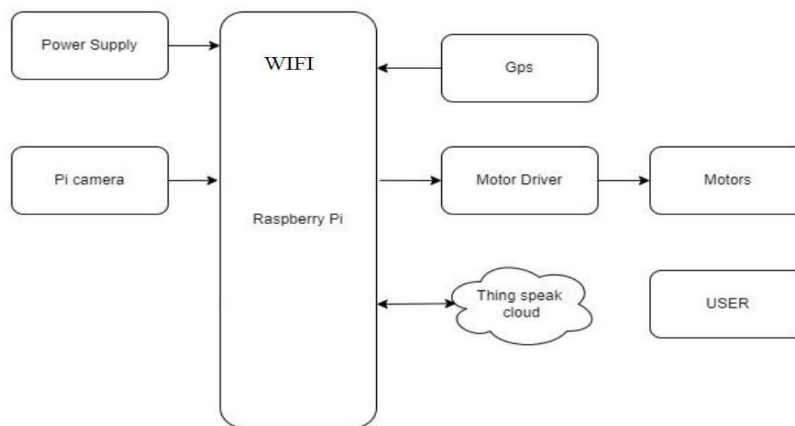
Block Diagram:

Fig.1.Block diagram of proposed system

3.1Operation of Spy Robot:

The above Fig (3.1) shows the block diagram of proposed system. The entire system is controlled by the Raspberry Pi. The block diagram consists of Raspberry Pi, Power Supply, Pi Camera, Motor Driver, GPS, Motors, cloud. Raspberry Pi would be required for processing the data which is collected from sensors and place the information in the cloud. Global Positioning System is a network of satellites which can be used to locate vehicles and people. It is used to calculate location, velocity, elevation and trilateration. L293D IC.is a typical Motor driver IC which allows the DC Motor to drive on any direction. Pi Camera module is a camera which can be used to take pictures images and videos. It is a portable light weight camera. It tells about photo resolution, video, size and weight.

For implementing the modern-Technology it should be known by all the users to make use of it. To reach and to full-fill all these needs we are using android mobile as a multimedia, user friendly device to control the robot. In this modern environment everybody uses smart phones which are a part of their day-to-day life. They use all their daily uses like newspaper reading, daily updates, social networking, and all the apps like home automation control, vehicle security, human body anatomy, health maintenance, etc. It has been designed in the form of applications which can be easily installed in their handheld smart phones. This project approached a robotic movement control trough the smart phones.

3.2.COMPONENTS
❖ Raspberry Pi 3B
❖ Processor / SoC (System on Chip)
❖ Power source
❖ DSI Connector
❖ RCA Video

❖ Audio Jack
❖ DC Motor
❖ L293, L293D (QUADRUPLE HALF H-DRIVERS)

3.3 GPS (GLOBAL POSITIONING SYSTEM)

The Global Positioning System (GPS) is a U.S. space-based global navigation satellite system. It provides reliable positioning, navigation, and timing services to worldwide users on a continuous basis in all weather, day and night, anywhere on or near the Earth.

GPS satellites circle the earth twice a day in a very precise orbit and transmit signal information to earth. GPS receivers take this information and use triangulation to calculate the user's exact location. Essentially, the GPS receiver compares the time a signal was transmitted by a satellite with the time it was received. The time difference tells the GPS receiver how far away the satellite is. Now, with distance measurements from a few more satellites, the receiver can determine the user's position and display it on the unit's electronic map.

The Global Positioning System (GPS) is the only fully functional Global Navigation Satellite System (GNSS). The GPS uses a constellation of between 24 and 32 Medium Earth Orbit satellites that transmit precise microwave signals, which enable GPS receivers to determine their location, speed. GPS was developed by the United States Department of Defense. Its official name is NAVSTAR-GPS. Although NAVSTAR-GPS is not an acronym, a few backronyms have been created for it. The GPS satellite constellation is managed by the United States Air Force 50th Space Wing.

Global Positioning System is an earth-orbiting-satellite based system that provides signals available anywhere on or above the earth, twenty-four hours a day, which can be used to determine precise time and the position of a GPS receiver in three dimensions. GPS is increasingly used as an input for Geographic Information Systems particularly for precise positioning of geospatial data and the collection of data in the field. Precise positioning is possible using GPS receivers at reference locations providing corrections and relative positioning data for remote receivers. Time and frequency dissemination, based on the precise clocks on board the SVs and controlled by the monitor stations, is another, use for GPS. Astronomical observatories telecommunications facilities and laboratory standards can be set to precise time signals or controlled to accurate frequencies by special purpose GPS receivers.

Fig 3. GPS Satellite

3.3.1 PI CAMERA:

An Internet protocol camera or IP camera, is a type of digital video camera commonly employed for surveillance and which unlike analog closed circuit television (CCTV) camera, can send and receive data via a computer network and the Internet The Raspberry Pi camera module can be used to take high-definition video, as well as stills photographs. The module has a five megapixel fixed-focus camera that supports 1080p30, 720p60, and VGA90 video modes, as well as still capture. It attaches via a 15cm ribbon cable to the CSI port on the Raspberry Pi. The camera module is very popular in home security applications, and in wildlife camera traps. It is shown in below Fig 3.15

Fig. 4.PI CAMERA

IV.RESULTS

The implementation of android controlled spy robot with night vision camera using Raspberry Pi is described in the previous chapter.
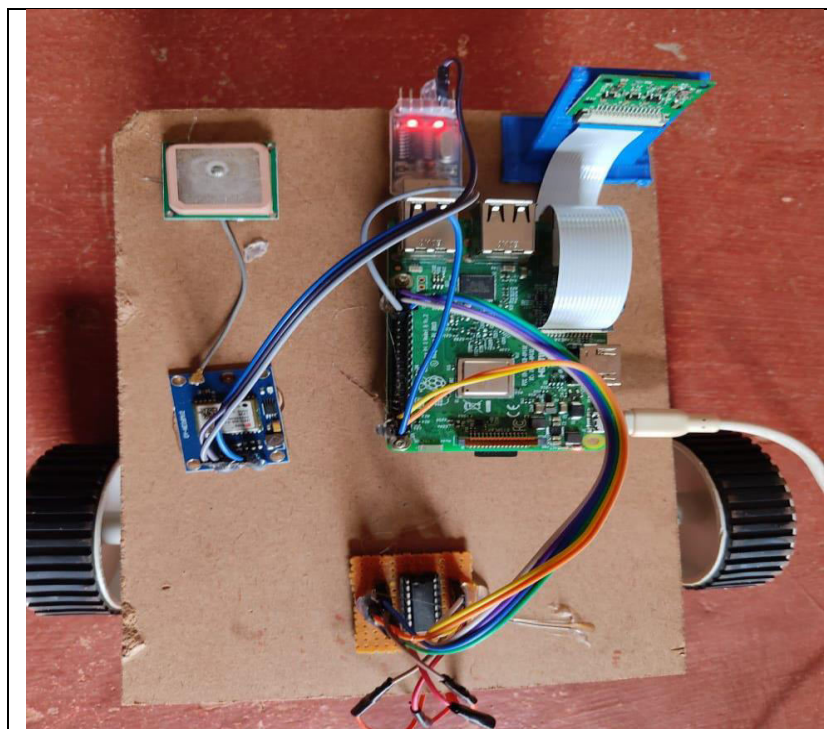

Fig 4.Android Controlled Spy Robot With Night Vision Camera Using Raspberry

Fig.5.Output results

IV CONCLUSION AND FUTURE SCOPE

Our main aim is to make the robot user friendly. It can easily move and capture the image and wirelessly transmit them. The robot can operate wirelessly by using Android application. The robot has reduced the human affords. It has high performance accuracy in movement section. It gives the live video streaming so it is very useful to humans.

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