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Vision Guided Land Robot By Military Applications

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Abstract—The intention of this project is to reduce human victims in terrorist attack such as 26/11. So this problem can be overcome by designing the CNN based spy robot which involves live camera, So that from this it will be easy to examine rivals when it required. This robot can quietly enter into enemy area and sends us the information via wireless camera. Since human life is always valuable, these robots are the substitution of soldiers in war areas. This surveillance robot can also be used in border areas, war fields etc. where there can be threat from intruders or terrorists. At the time of war where it can be used to collect information from the enemy terrain and monitor that information at a far secure area, and safely devise a plan for the counter attack, Tracking locations of terrorist organizations and then plan attack at suitable time. Making a surveillance of any disaster affected area where human beings can't go. Here object detection is used for implementing spy robot, robot is fully autonomous can detect and avoid obstacles using ultrasonic sensor.CNN is used for detecting objects this program is implemented using python.

Keywords—Android Application, Robot, Object Detection, IP connectivity.

I-Introduction

In today's world the age of apply autonomy field is developing exponentially and a part of the well known automated items are utilized to a great extent by the research networks, guard, scholastic and businesses. The idea and execution cost of a robot is less at that point procuring a human parental. The robots can be reinvented quicker and increasingly effective. This robot ought to have adequate insight to reach the biggest field. It can perform various tasks in unregulated situations with or without human address. This robot helps us to monitor well being and another major use of this robot is protection. The defense is basic in the remote observing and control frameworks, for example, canny home situations, shopper reconnaissance framework, and so forth. The continuous person and object location are fundamental for different fields like home safety frameworks, correspondence frameworks, observation frameworks. Fundamentally the observation frames are emerging with numerous cameras that are put in different points of view to follow human objects. Especially the following assignment is required on cameras for dynamic articles that build a number of cameras utilized in the framework. A keen observation framework with numerous cameras is convoluted and also expensive.

In this method, a robot must operate the region remotely while a person must monitor the area using a distant yet manually controlling device, and the more humans necessary to implement this system, the more expensive it will be. The hardware and software implementations are divided into two areas in this project design. The hardware

implementation entails the creation of an intelligent robot, while the software implementation entails the programming of a Raspberry Pi using the Python programming language. A camera is used to detect enemy presence in a battle or border area by using a deep learning algorithm to recognize humans. In this method, a robot may classify objects in a frame as humans, animals, or inanimate objects, and make decisions accordingly.

In the suggested framework a solitary camera is introduced on a robot and the robot can travel in all directions to take photographs in various edges. Here the framework is entirely adaptable to screen any monitoring item with the assistance of the camera and it is increasingly appropriate for reconnaissance frameworks.

A robot can be constrained by remote control. The remote control gives extra advantages, including expanded adaptability and diminished establishment cost. In most cases the web innovation is utilized for development control and every single other reason like a picture or video caught by the robot shown are essentially a self contained tribute to the wonders of technology. This surveillance robot can also be used in border areas, war fields etc. where there can be threat from intruders or terrorists.

II-Proposed Methodology

This undertaking permits to drive the robot utilizing ESP8266 Node MCU that imparts (and drives around) with a cell phone. The telephone is running an application made in MIT Application creator and a cell phone is fixed on the highest point of the robot which permits you to control and drive it around toward any path and the video and sound feed is returning to the host PC and permits you to continue driving the robot in any event, when the robot is far out.

This paper aims at helping the mobility-challenged individuals with a novel robotic companion, which is a walker-type mobile robot capable of accompanying the human user and keeping the user at the center for protection and possible power assistance. Figure 2.1 shows the Robot setup using Raspberry pi and the corresponding receier end is showa

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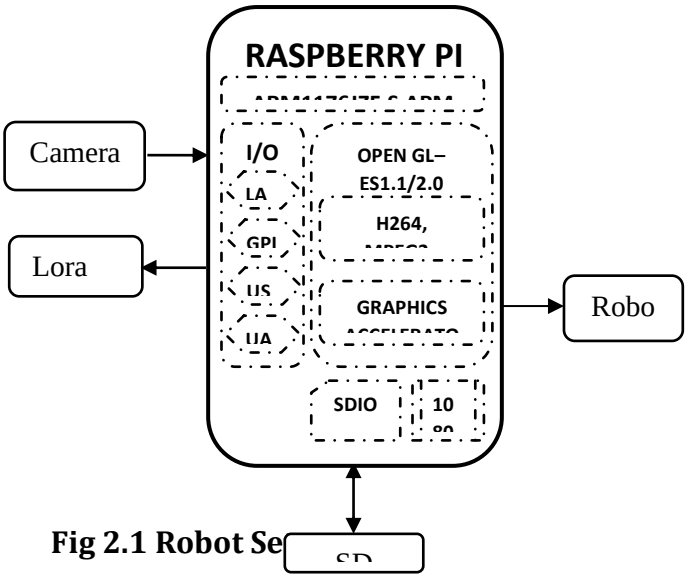

Fig 2.1 Robot Se

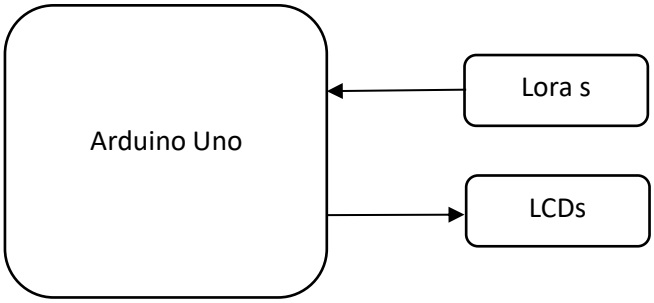

Fig 2.2 Receiver side

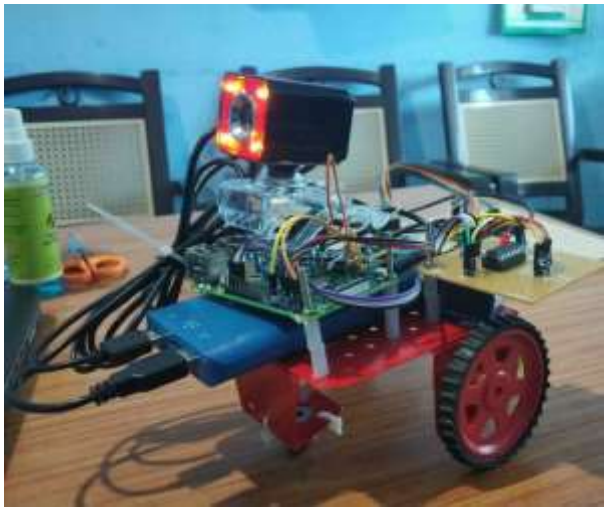

Fig 2.2 Surveillance Robot

III- Hardware Description

The proposed model consists of following parts:

a) Raspberry Pi Module

The Raspberry Pi (Fig. 3.1) is a compact single-board computer developed in the United Kingdom by the Raspberry Pi Foundation to encourage computer science education in schools and underdeveloped nations. Outside of its main market, the original model became significantly more popular than expected, with usage such as robots.

A Broadcom System on Chip (SOC) powers the Raspberry Pi, which contains an ARM-compatible CPU, on-chip graphics processing unit, and Videocore IV.

Raspberry Pi is divided into three generations: Raspberry Pi 1, Raspberry Pi 2, Raspberry Pi 3, and a low-cost Raspberry Pi zero.

The first Raspberry Pi model, the Raspberry Pi 1 Model B f, was released in February 2012.

Fig 3.1 Raspberry Pi

b) Camera

A webcam is a video camera that feeds or streams an image or video in real time to or through a computer to a computer network, such as the Internet. Webcams are typically small cameras that sit on a desk, attach to a user's monitor, or are built into the hardware. Webcams can be used during a video chat session involving two or more people, with conversations that include live audio and video. For example, Apple's iSight camera, which is built into Apple laptops, iMacs and a number of iPhones, can be used for video chat sessions, using the iChat instant messaging program (now called Messages). Webcam software enables users to record a video or stream the video on the Internet. As video streaming over the Internet requires a lot of bandwidth, such streams usually use compressed formats. The maximum resolution of a webcam is also lower than most handheld video cameras, as higher resolutions would be reduced during transmission. Various lenses are available, the most common in consumer-grade webcams being a plastic lens that can be manually moved in and out to focus the camera. Fixed-focus lenses, which have no provision for adjustment, are also available. As a camera system's depth of field is greater for small image formats and is greater for lenses with a large f-number (small aperture), the systems used in webcams have a sufficiently large depth of field that the use of a fixed-focus lens does not impact image sharpness .

Fig 3.2 Camera

c) LORA

LORA WAN is a low power wide area network technology (LP-WAN) designed for Internet of Things (IoT) and smart sensor applications. As the name implies, long range transmission capability with less power consumption makes LoRa a significant player in IoT networks. In LoRa technology, a message transmitted by any device can be received by single or multiple gateways. The received messages will be forwarded to the central network for processing. Smart server architecture will handle these messages to each related applications. LoRa alliance is an open, non-profit organization of members that standardize, develop, monitors and improves LoRa standard. Internet of Things is one of the major drivers behind this highly efficient LP-WAN technology

Fig 3.3 LORA

d) L293D Motor Driver

L293D is a typical Motor driver or Motor Driver IC which allows DC motors to drive in either direction.(fig 3.5.4) L293D is a 16-pin IC which can control a set of two DC motors simultaneously in any direction. It means that you can control with a single L293D IC.Dual H-bridge Motor Driver integrated circuit (IC).It works on the concept of H-bridge. H-bridge is a circuit which allows the voltage to be flown in either direction. As you know voltage need to change its direction for being able to rotate the motor in clockwise or anticlockwise direction, hence H-bridge IC are ideal for driving a DC motor.In a single L293D chip there are two h-Bridge circuit inside the IC which can rotate two dc motor independently. Due its size it is very much used in robotic application for controlling DC motors. Given below is the pin diagram of a L293D motor controller.

Fig 3.4 L293D Motor Driver

e) Liquid Crystal Display(LCD)

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16×2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reasons

being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.A 16×2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5×7 pixel matrix. This LCD has two registers, namely, Command and Data.(Fig 3.5.7)The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD.

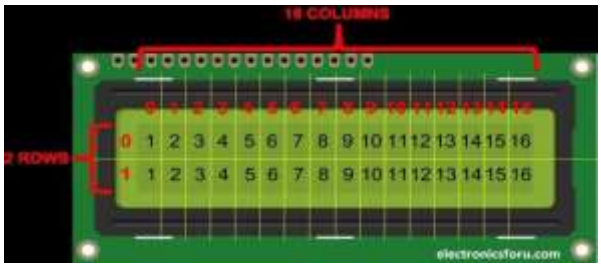

Fig 3.5 LCD

IV-SOFTWARE

A) Raspberry pi Software

In Raspbian, you can change your password by running Install Raspbian, XBMC, Risc OS, OpenElec & ArchLinux Easily With NOOBS.For a simpler, more streamlined install of the more popular Raspberry Pi distros such as Raspbian, ArchLinux, XBMC and OpenElec media centres, as well as Risc OS and Pidora – you can employ NOOBS, the New Out Of Box Software installation system.(Fig 3.6.1).Many operating systems are available for Raspberry Pi, including Raspberry Pi OS, our official supported operating system, and operating systems from other organisations.The point at which you're happy with the installed OS is precisely when you should make a clone of it. This is a full backup image of the SD card saved to your hard disk drive (or second SD card) that can be easily flashed should you run into trouble.

Fig 4.1 Raspberry Pi Software

B) Python IDE

An Introduction to Python: The Raspberry Pi gets the first half of its name from a long-standing tradition of using fruit to name new computing systems—from classic microcomputers like the Acorn, Apricot and Tangerine to more recognizably modern brands including Apple and BlackBerry—but the second half comes courtesy of the Python programming language. Flexible and powerful, Python was originally developed in the late 1980s at the National Research Institute for Mathematics and Computer Science by Guido van Rossum as a successor to the ABC language. Since its introduction, Python has grown in popularity thanks to what is seen as a clear and expressive syntax developed with a focus on ensuring that code is readable .Python is a high-level language. So far, you have learned how Python can be used to create standalone programs, but the language can also be used to create programs that communicate with the outside world over a computer's network connection.

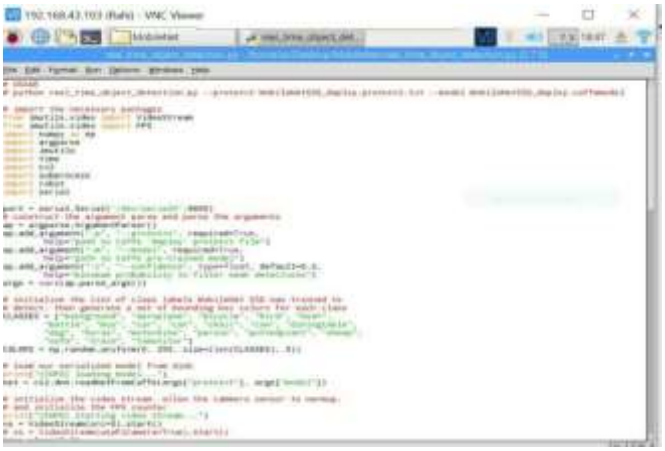

Fig 4.2 Python IDE

V- Results & Discussions

The Robot is detect the movement of Humans in the Border. Camera is used for detecting enemy presence in battle or border areas by recognizing humans through deep learning algorithms.This way robots are able classify objects in a frame into humans, animals and inanimate objects and make decisions on their own. The remote control gives extra advantages, including expanded adaptability and diminished establishment cost. In most cases the web innovation is utilized for development control and every single other reason like a picture or video caught by the robot and shared through the web. Surveillance robots shown are essentially a self contained tribute to the wonders of technology.

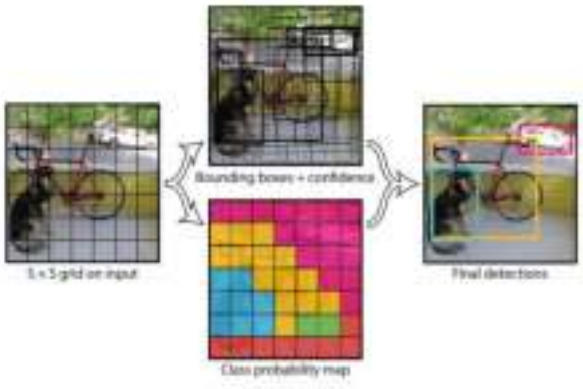

Fig 5.1 Prediction of Model

Fig 5.2 Predicted Output

VI-CONCLUSION

The primary contribution of the proposed framework is incorporating a portable robot with processor innovation to give the better observation and administration. By utilizing camcorders, data returned by Robot investigated the constant pictures so the calculation exertion, cost and asset necessities required are essentially diminished. Be that as it may, picture preparing/video handling in the raspberry pi is slow and can be progressed through artificial intelligence and as of advancing deep learning techniques. In the existing system, robot has to control remotely where the person has to monitor the area using remote but manually controlling and man power is required to implement this system. This project design can be divided into two sections; hardware and software implementations. Camera is used for detecting enemy presence in battle or border areas by recognizing humans through deep learning algorithms. This way robots are able classify objects in a frame into humans, animals and inanimate objects and make decisions on their own. The Detected images is stored in source of Memory. Tracking locations of terrorist organizations and then plan attack at suitable time. Making a surveillance of any disaster affected area where human beings can't go. Here object detection is used for implementing spy robot, robot is fully autonomous can detect and avoid obstacles using ultrasonic sensor.CNN is used for detecting objects this program is implemented using python.

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