

IOT Surveillance Robot Car

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Abstract: *The Technology behind this paper is to develop a Robot to perform the act of surveillance in domestic areas. Nowadays robots plays a significant role in our day today life thus reducing human labor and human error. Robots are going to be manually controlled. In this project, one can manage the Robot with the help of mobile through Internet and might conjointly get the live streaming of video each in daytime furthermore as at night time with the help of wireless camera in the robot. The mechanism are going to be controlled manually with ESP32 CAM with TTL. This robot uses motor driver to the controller that controls the mechanism.*

Keywords: Robot, Wifi Module, TTL, Surveillance, Wireless Camera

I. INTRODUCTION

Technology has brought a dynamic and tremendous modification in AI and automation field that ranges in all kinds of areas. Surveillance is the process of systematic observation or direction maintained over an individual, group, etc. particularly one in custody or beneath suspicion. Therefore surveillance is needed within the areas like border areas, public places, offices and in Industries. It is mainly used for observation activities. The act of Surveillance can be performed each indoor also as in outside areas by humans or with the help of embedded systems like robots and alternative automation devices. A robot is nothing however an automatic electronic machine that's capable of playing programmed activities therefore replacing human work, providing extremely correct results and simply overcoming the constraints of citizenry. Therefore replacement of humans within the surveillance fields is one of the greatest advancement in AI.

The mechanism consists of ESP32 controller that acts as the heart piece of the robot. This mechanism additionally consists of DC motors, wheel chassis, battery, Wi-Fi Module and motor driver. The mechanism will be operated manually. User end communicates with the mechanism by implementing the Internet of Things. This may be achieved through code, that is employed for IOT developing comes. The command area unit sent to the mechanism by means of code received by ESP32 controller via Wi-Fi module since each area unit are interfaced with one another. Therefore the mechanism will be controlled in a wireless manner. During this project, we tend to use wireless transmission camera that gives video information which will be received at the user end.

II. EXISTING SYSTEM

- Already existing systems use robots that have restricted vary of communication as they're supported by RF Technology, Zigbee and Bluetooth.
- Some existing robots use short range wireless camera.
- Some existing robots will solely be controlled with a manual mode that needs human direction throughout the full Surveillance process.

2.1 Proposed System

- By interfacing Wi-Fi module with ESP32, we are able to get unlimited vary of operation.
- Robots will be operated in manual modes.
- By using ESP32 controller, the price and quality will be reduced.
- The communication with the robot happens in a secured manner.

2.2 Objectives and Goals

- Receive and transmit information from remote place.
- Receive directions and information via Wi-Fi from Android mobile phone.
- Move the robot with received info.
- Appropriate to integrate with different electrical devices.

III. LITERATURE REVIEW

Many definitions of the Internet of Things exist, however at the foremost fundamental level it will be delineated as a network of devices interacting with each other via machine to machine (M2M) communications, facultative assortment and exchange of information [3], [4]. This technology permits automation inside an oversized range of industries, in addition as permitting the gathering of massive knowledge. Hailed because the driver of the Fourth technological revolution [5], Internet of Things technology has already found business use in areas like sensible parking [6], preciseness agriculture [7], and water usage management [8]. Extensive research has additionally been conducted into the utilization of IOT for developing intelligent systems in areas together with tie up step-down [9], structural health monitoring [10], crash-avoiding cars [11], and sensible grids [12]. While the same fields seem immensely completely different to tending, the research conducted inside them verifies the credibility of Associate in Nursing IOT-based healthcare system. Existing systems in alternative fields have established that remote monitoring of objects, with knowledge assortment and news square measure possible. The robot is controlled by smart phone and hardware. This kind of robot is helpful in any spying reason field like military and police further it can be used for security of assets [13]. This can thus be expanded and tailored for watching the health of individuals and reporting it to relevant parties like caretakers, doctors, emergency services, and tending centers. We've got applied IOT in AI. That mechanism is also applied in healthcare too in addition as remote sensing.

IV. HARDWARE USED

- **ESP32-CAM:** ESP32-CAM could be a affordable ESP32-based development board with onboard camera, little in size. It's a perfect answer for IOT application, prototypes constructions and DIY comes. The board integrates WLAN, traditional Bluetooth and low power BLE, with two high- performance 32-bit LX6 CPUs.
- **FTDI:** The FTDI (Future Technology Device International) adapter could be a device that allows connecting a USB port to a microcontroller. These are common devices, and it's a minimum of one around in workshop as many micro controllers need them. FTDI needn't to be hooked up for good to the automaton, it's simply required to program the ESP32CAM.
- **MOTOR DRIVER:** There area unit (at least) 2 motorized wheels, and people motors can want a Motor driver or "H-Bridge" interface to provide ample power and current at the Proper polarity. TB6612FNG H-Bridge controller is employed. In contrast to the favored L298N H-Bridge, the TB6612FNG uses MOSFETs to permit for larger current handling and less temperature reduction. The TB6612FNG is additionally a lot of economical, providing Virtually no free fall as opposition the one.4-volts you lose once mistreatment associate degree L298N. These modules area unit cheap and out there at several physical science Vendors.
- **ROBOTIC CHASIS:** The robotic car frame has rechargeable battery as power supply, wheels, ball castor etc.

V. SOFTWARE USED

5.1 ARDUINO IDE

Arduino Integrated Development setting – or Arduino package (IDE) – Contains a text editor for writing code, a message space, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino and Genuino hardware to transfer programs and communicate with them.

5.2 SYSTEM DESIGN

The system consists of 2 major sections – one is that the user section and alternative is the golem section. Therein the user section will possess portable computer or mobile for communicating with the golem finish. Therefore by employing a portable computer or a mobile the user section is a conveyable one compared to those who uses a typical stationary

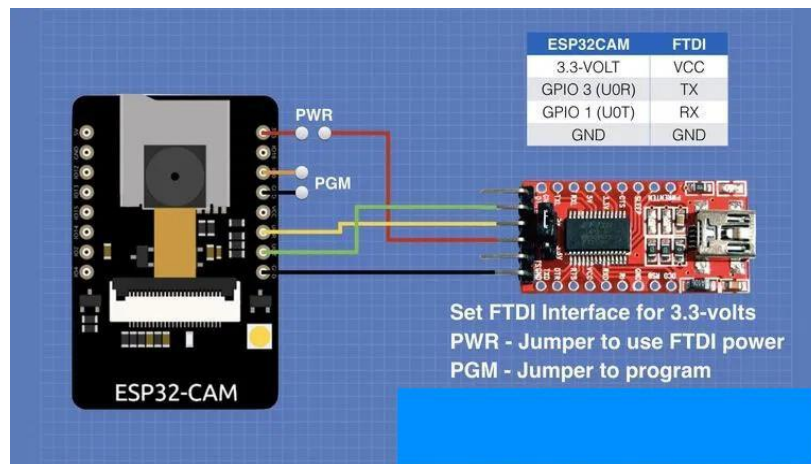
computer system. The communication is performed with WLAN technology, but that comes at the value of restricted vary. Therefore so as to implement the concept of increasing the vary we are able to go connecting the user section with the web which is that the main thought of Internet of things at the golem finish, we tend to square measure mistreatment Associate in Nursing ESP32 controller placed on the body or the chassis of the golem, that is that the integral a part of the robotic vehicle. Below the chassis, the wheels square measure connected with DC motors that square measure of thirty rate every. Every motor needs 12v provide, provided by means that of Associate in Nursing external battery supply. The motors square measure interfaced with through motor driver motor driver they're used for amplification purpose. The controller is coded with IDE code so as to work the golem in acceptable directions. This is the manual mode operation related to it.

VI. CIRCUIT CONNECTION

FTDI with ESP32 CAM

The robot automatically hooks up by connecting the FTDI adapter to the ESP32CAM module . This adapter to load the code that you simply produce for the automotive into the ESP32CAM. The wiring is incredibly easy, basically all we tend to do is connecting the transmit and receive pins on the ESP32 to the receive and transmit pins on the FTDI adapter (i.e. ESP32CAM transmit connects to FTDI receive, and vice versa). The FTDI adapter, rather than exploitation the golem automotive power offer. You might want to try and do this throughout programming, particularly if you engineered the ESP32CAM module to be removable as I did. It permits you to avoid connecting the golem automotive power offer and FTDI adapter offer directly together.

PGM – to place the ESP32CAM module into programming mode it's necessary to tie GPIO pin zero to ground. This jumper accomplishes this. It must be inserted throughout programming, and removed throughout traditional operation. Make sure that you simply set your FTDI adapter for three.3-volt logic, this is often sometimes accomplished either with a jumper or solder-pad.



MOTOR CONTROLLER WITH ESP32 CAM

The TB6612FNG motor management has all of its control inputs on one facet of the module, and every one of the facility and motor connections on the opposite facet. This will modify the wiring task. Both PWMA and PWMB inputs are connected along and driven by a single GPIO output, on pin GPIO pin twelve. This attach saves one GPIO pin, at the expense of constructing it not possible to regulate the motor speeds severally. The arrangement of the motor outputs, they “mirror” one another, the motor control inputs on the opposite facet of the module also are “mirrored” in a similar fashion.

MOTOR CONTROLLER WITH DC MOTORS WITH SUPPLY

The pair of 18650 LiPo cells in the supply, each cell provides an output of 3.7-volts for a total of 7.4-volts. The 7.4-volts are used to power the motors driver directly. It supplies 5-volts for the ESP32CAM. Although the ESP32CAM is Actually

a 3.3-volt module it has dual power inputs and many experimenters Report better results using the 5-volt one. Motor Driver is used to run the two DC Motors with efficient manner And easy to control the motor with driver.

VII. CONCLUSION

In this work, the framework for creating an automaton for police work purpose is proposed. It overcomes the matter of restricted vary police work by mistreatment the concept of IOT. The automaton will be controlled with the assistance of mobile manually. Our projected automaton is tiny in size so maneuvering into space wherever human access is not possible. Wireless technology is one in every of the foremost integral technologies within the natural philosophy field. This technology is employed is a supreme part of police work act. This provides extremely economical and a price effective automaton that replaces human work and reduces human labor and performing observance works during a well effective manner.

FURTHER ENHANCEMENT

- In further development the distance range may be to 1 kilometer.
- The number of sensors may be increased to get more data.
- Machine learning using the json and XML file for predicting human
- Condition and weather condition can be developed.

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