Secure Surveillance Rover for Smart Environment

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Abstract: **In today's digital era people are running their life to support their needs in which security comes into the vital role to prevent their belongings and personal data from invaders. Having a mini rover for surveillance, to safeguard our belongings would be greatly needed. This project enables a way to do it. Rovers have their significance in portability. This project solely focuses on video data transmission from the rover to the mobile application by integrating using the Internet of Things. This rover also possesses a camera alongside with face recognition which will possess the ability to identify the person and also distinctify the objects.**

Index terms: Internet of Things, Surveillance rover, Security, Smart environment

INTRODUCTION

Internet of things, or IoT, may be a system of reticulate computing devices, mechanical and digital machines, objects, animals, or people who area unit supplied with distinctive identifiers (UIDs) and therefore the ability to transfer knowledge over a network while not requiring human-to-human or human-to-computer interaction. Associate in Nursing IoT systems consist of web-enabled good devices that use embedded systems, like processors, sensors, and communication hardware, to collect, send, and act on knowledge they acquire from their environments. The aim of the Rover is to drift around and supply video data from the given atmosphere and to send that obtained data to the user. During this project, one will manage the rover with the assistance of a mobile or portable computer through the web of Things. With the obtained live streamed video output, the action of police investigation is performed.

MOTIVATION OF THE PROJECT

As security in these days gets more complicated as invaders are getting smarter day by day we need some external support to support our needs. The predominant goal of this system is to build a surveillance rover to monitor user's belongings as the live video of the environment will be seen through an application where the data transmission will be secured. Having a rover will help the user where he/she can view those from anywhere in the world.

PROBLEM STATEMENT

Security is a big threat in the modern world for the general people. Intenders can easily break into our environment and steal our belongings. Monitoring our personnel is a predominant need. Surveillance cameras are widely used but they don't give proper flexibility and have a fixed coverage.

LITERATURE SURVEY

1. Robot-assisted Backscatter Localization for IoT Applications

Authors: Shengkai Zhang, Wei Wang, Sheyang Tang, Shi Jin, Tao Jiang
Findings: Recent years have witnessed the speedy proliferation of scatter technologies that notice the ever-present and future property to empower good cities and good homes. Localizing such scatter tags is crucial for IoT-based good applications. However, current scatter localization systems need previous information of the location, either a map or landmarks with far-famed positions, that is grueling for reading. To empower universal localization service, this paper presents Rover, an interior localization system that localizes multiple scatter tags with no start-up price employing a mechanism equipped with mechanical phenomenon sensors. Rover runs during a joint optimisation framework, fusing measurements from backscattered local area network signals and mechanical phenomenon sensors to at the same time estimate the locations of each the mechanism and therefore the connected tags. Our style addresses sensible problems together with interference among multiple tags, real-time operation, further because of the information marginalization drawback in addressing degenerated motions. We have a tendency to model Rover exploitation ready-to-wear local area network chips and customized scatter tags. Our experiments show that Rover achieves localization accuracies of thirty-nine.3 cm for the mechanism and seventy four.6 cm for the tags.

2. IoT developed Wi-Fi Controlled Rover WithRobotic Arm Using NodeMCU

Authors: Dr. Usha Chauhan, Gaurav Singh, Ashirwad Kumar, Anurag Yadav
Findings: In recent times, technology is growing quickly with increasing human wants and expectations. The technological growth is achieved with the assistance of machines that are designed and integrated in a very thanks to meet current necessities. but there are numerous analysis fields for this however the artificial intelligence field particularly the Robotic arms and Rovers has very caught our attention. Robotic arms work with the desired predefined command by the developer with a selected degree of freedom

that builds it one in every of the vital tools for engineering applications. On the opposite 0.5 Rovers too have its own significance in movability operation. This paper alone focuses on development of a tool by desegregation higher than technology, Robotic arm on prime of Rover for selecting and putting operation in dangerous environments. NodeMCU acts because the brain of the system and also the whole system is controlled employing a smartphone.

3. IoT Based Smart Multi Application Surveillance Robot

Authors: Prof.Baswaraj Gadgay, Aishwarya K Telkar

Findings: The main goal of this paper is to style and develop a police investigation golem that may cut back the casualties within the war field. The golem acts as a police investigation golem to capture the persona non gratas encompassing info before the intruder is attacked by the troopers. The optical maser gun equipped on the golem aims to shoot the persona non grata on sight. The problems associated with short-range communication to manage the movement of the golem is overcome by mistreatment of AN IoT technology. The golem movement may be controlled on AN humanoid phone by sitting anywhere from the world. This project includes 5 phases: dominant the golem in manual mode mistreatment IoT technology or in machine-controlled mode via android/PC, Wireless vision camera live video streaming with audio communication, PIR and Metal detection sensors, GSM & GPS technology, and an optical maser Gun. The execution begins once the golem halts on the detection of the PIR detector and sensor detector. The work aims to scale back the loss of life and accomplish safety within the war field. The golem will perform multiple application like if any bombs square measure placed at public places this golem acts as a bomb detector golem mistreatment the sensor detector and also the location of the bomb detected is half-track.

4. Design and Development of IoT controlled Smart Surveillance cum Waste Cleaning Rover

Authors: Shrikant V. Sonekar, Bhargav J. Ditani, Jay P. Patel

Findings: The fast increase in utilization of technology and advancement created in artificial intelligence, provides a strong actuation for fast development of service robots. In sectors like shopping malls, ectozoon markets, lawns, enterprise premises, etc wherever mobs of individuals gather, it's essential to sustain a healthy public atmosphere and security. a heap of man-power is employed for scrutiny and improvement of such areas. This paper focuses on net of Things based mostly wireless improvement rovers developed on raspberry pi platform with management ability by internet application from any distance. For improvement operation vacuum systems with necessary filters and air suction are used. The plan is integration of sensors, camera and process unit.

PROPOSED SYSTEM

- Upgradable
- Flexibility
- Vast coverage
- Upgradable, when new technologies as comes into market
- Economical when compared to others systems
- Controllable

MODULES

- **Data detection:** In this process, the live footage of the people and objects in the environment will be detected and captured by the ESP32-CAM. Intenders can be differentiated from others. Intenders can be differentiated from known peoples. Familiar objects can also be categorized. Enrolled face has a green line around the person's face. Whereas intenders with a red one. Familiar objects also have a green box around them. Object tracking is also enabled.

- **Data transmission:** In this process, the processed data from ESP32 will be viewed through the mobile application of ESP32 cam. In detail, ESP32-CAM and Android Phone are connected to the same wifi network. ESP32-CAM acts as a UDP server listens on port 6868, Android Phone sends a broadcast message to address 255.255.255.255:6868 to acquire the address of the ESP32-CAM, then create a WebSocket connection to that address port 86. After a connection is established, ESP32-CAM will stream images to the Android phone, then the image processing is done there. ESP32-CAM recognizes new objects and compares them with the existing objects data in the dataset. When two object's data match together it show's with the green box line. The rover control is completely done through the ESP32-CAM application.
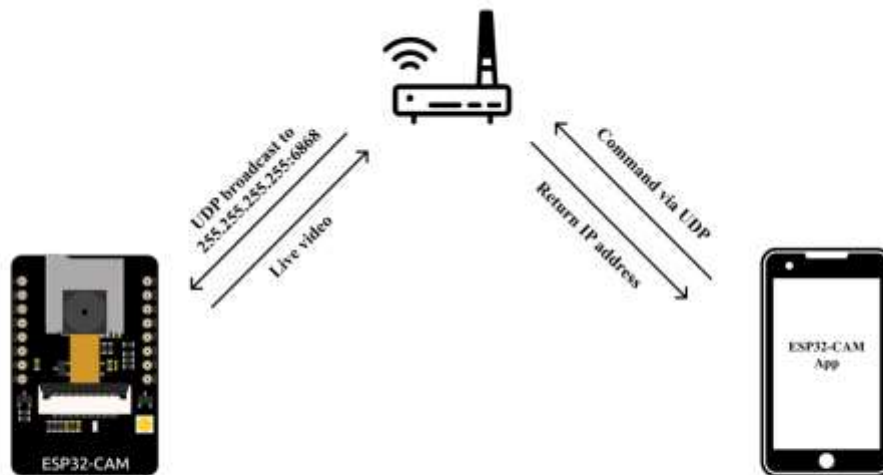
CONCLUSIONS

By using Surveillance security rover we are able to watch what is happening in our personnel environment and the power consumption, wages are comparatively less while comparing with existing systems and products in the market. This predominant product will be more useful in machinery industries as well. As it reduces the manpower for security. Decrease of manpower increases wages and it'll be beneficial to the industries, the industries can use those wages for other purposes.

FUTURE SCOPE

In future, this project can be developed in a way, as it can be used as an alert system, sending signals to nearby police stations if a criminal is found by using image processing techniques. It opens the way for military usages as this rover can also be integrated with a Robotic arm for picking and placing operations in hazardous environments and surveillance which saves lives of many people. And it can also be used in agricultural lands to plow, seed, weed and water the fields.

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