International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 7 July 2022, pp: 666-670 www.ijaem.net ISSN: 2395-5252

Automated Guided Vehicle for Surveillance

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Submitted: 01-07-2022 Revised: 10-07-2022 Accepted: 13-07-2022

ABSTRACT— Automated guided vehicle is the future drift that provides wireless control through the controller (that is the web page is created for the controlling of the robot and for the camera). The movement of the robot is controlled by user inputs.This AGV is used to transport for the usage of small and light weight goods in bulk quantity. Here the thing is most important one is ESP32CAM we used this one for the monitoring and roadmap for controller for the transport.The security of the supplied items is directly impacted by the automated guided vehicle's (AGV) capacity to travel steadily. One of the reasons an AGV moves in an unstable manner is a change in the loads during the delivery procedure. In order to handle the load, this study examines the development and application of the AGV's speed control system.

***Keywords*—**AGV (Automated Guided Vehicle), Esp32cam, IPaddress, surveillance controlling, webserver, motor driver, pan.

I. INTRODUCTION

Material handling AGVs are used to transfer things from one location to another. In 1955, AGVs were first made available. Since its inception, the utilization of AGVs has significantly increased. Both the variety of types and the number of application areas have grown dramatically. Both indoors and outdoors, AGVs can be employed for activities like production, distribution, and transshipment. All kinds of manufacturing-related items are transported using AGVs. Over 20,000 AGVs have been employed in industrial settings, claims the report. Distribution locations include cross docks, engineering center's, and deposits. The AGVs are employed in these locations to transfer pallets internally, for instance, between the various departments, including the areas for reception, storage, sorting, and shipment when transshipping such as shipping containers, AGVs handle the movement of goods between modes of transportation. receiving a brief introduction to the automation technology that container terminals can use. Additionally, numerous inside and outdoor situations are specified along with the necessary navy-guiding systems and vehicle guidance. AGV systems may carry out shipping applications between ships and inland transport, and they can also be used in the process of outdoor transportation, claim Haefner and Bieschke. Both the port and its clients gain from this.

An AGV's carrying capacity must be at least 5 kg in order to transport a container. Transporting pallets to warehouses is important for a smaller capacity. Additionally, they employ signs at guided automated container vehicle terminals (AGVs).

We'll talk about the issues raised in the literature on the use of AGVs in manufacturing and the newer application areas, such as distribution, transshipment, maintenance, and transportation systems. With the realisation of the Internet of Things, new technologies have exploded in the exciting field of control. Intelligent transportation, smart security, and smart homes are just a few of the applications that IoT and AI are employed to produce today. IoT now makes advantage of wireless connectivity.

The number of AGVs used, the quantity of transport applications, the level of AGV occupancy, the distances travelled, and the number of pick-up and delivery sites where the transport applications are made available are the key variations between traditional and innovative application areas. AGVs have been employed in significant numbers to carry out repeated activities, transport jobs to container terminals, and external jobs, in contrast to reinforcement systems. AGV systems for port system manufacture, distribution, transshipment, and transshipment were determined to be the focus of previous research on the design and control of automated systems of guided vehicles. The majority of models were found to be

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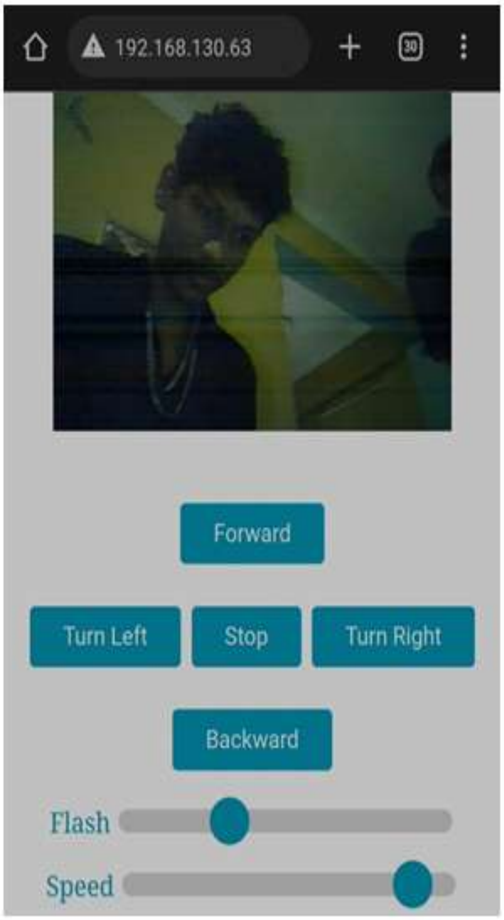
applicable to architectural issues in teaching facilities. Some of these models—both the new and the old—have already shown themselves to be effective. It is necessary to create a new analytical and simulation approach for large AGV systems.

II. LITERRATURE SURVEY

A. Wireless Controlled Surveillance Robot.
A machine that is mounted or put on a mobile platform and can be operated according to predetermined instructions is referred to as a mobile robot. Many industries employ mobile robots today. Many of the sophisticated robots we now see descended from earlier mobile robots. This technique has led to the development of numerous new applications. In many different industries, new ideas are being created as a result of the mix of mobile devices and robots.
Because they are portable and have a longer battery life than laptops, mobile devices are currently used in a range of industrial applications. Additionally, they have a data plan through a cellular provider, which is useful because once the connection is made, we can communicate with the mobile robot.



B. Surveillance Security Robot With Automatic Patrolling Vehicle
Using electronic devices (like CCTV cameras) for remote observation or intercepting electronically transmitted data are both considered forms of surveillance (such as Internet traffic or phone calls). Additionally, it might apply to straightforward, low-tech techniques like postal interception and human intelligence operatives.
Surveillance can be used by governments and law enforcement to uphold social order, recognise and track dangers, and stop/investigate criminal activities. Numerous privacy and civil rights organisations, such as the Electronic Frontier Foundation and the ACLU, have expressed concern that allowing ongoing increases in governmental surveillance of citizens will lead to a mass surveillance society with extremely constrained, if not non-existent, political and/or personal freedoms.

The typical fixed surveillance system's dead zones are monitored by an automated patrolling vehicle, which serves as a security patroller in the security system. Using a wireless network improves the ability to monitor remotely. The facial detection technology has also been upgraded to record and analyse the intruders.
C. Android Based Security and Remote Surveillance System
Our daily lives now revolve around mobile gadgets. An increasingly crucial component on mobile phones is the security and remote surveillance system. The modern home incorporates numerous automation technology. The user can control many items with the remote control, including air conditioners, lights, and door locks. Khan claims that the access control system was created to prevent anyone other than authorised guests from entering the home while the user was gone. The door alarm goes off when the system receives the incorrect password three times in a row. However, this technique works incredibly well when used with mobile devices that can access the internet.

III. METHODOLOGY USED

The robotic vehicle is made up of both hardware and software systems. The robotic vehicle's design approach is a prototyping method for hardware implementation and an agile method for software implementation. The primary goal of our design is to move the device in response to a button press. As a result, we developed a simple robot that can move forward, backward, left, and right by pressing a single button.
Figure 1: Overview of Frontend Design

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Components used:

- ESP32-CAM
- ARDUINO UNO
- FTDI Programmer
- DC Motors (4)
- Servo Motors
- Motor Driver (L293D, L298N)
- Battery(12V)

The Microcontroller Integrated Development Environment (MICDE) is the tool used for programming microcontrollers (IDE). It is a cross-platform programmer created using C and C++ functions. The ESP32-Camera and Arduino Uno boards both receive the compiled and written codes that make up the system's intelligence via the Arduino IDE. Embedded C is the programming language.

The Arduino IDE was configured to work with the ESP3-Camera board in order to upload code quickly. A JSON file was added to the "preferences" section of the dialogue box to alter the "Additional Board Manager URLs" field. The Wi-Fi setup code was uploaded to the board through the usage of LAN configuration. The ESP32 board successfully runs the Wi-Fi code, resulting in an automatic LAN connection.
To upload the code, an FTDI board is needed because the ESP32-Camera is USB port less. The VCC and GND pins of the ESP32 are connected to the corresponding pins on the FTDI board. The Receiver and Transmitter of the FTDI board are connected to the Transmitter and Receiver of the ESP32. Two DC motors are connected to ESP32 via the L293D module.

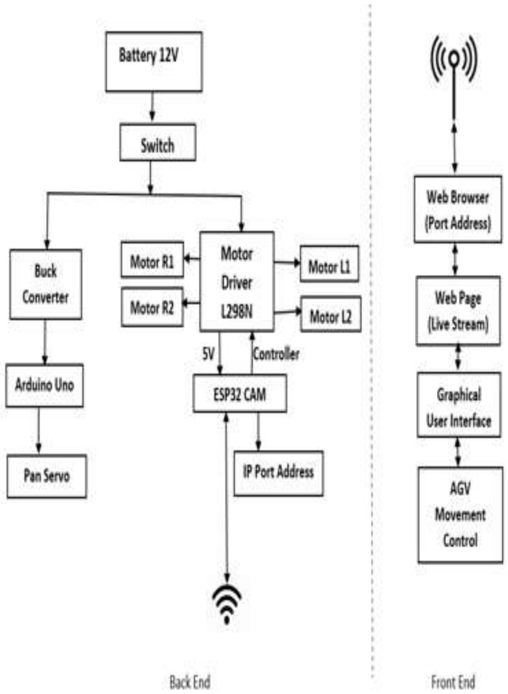

Figure 2: Block Diagram

The OV2640 camera, ESP32-S CPU, and microSD card port are all features of the surveillance bot ESP32-CAM module. On a MicroSD card slot, pictures taken by the camera can be kept. In this scenario, the OV2640 camera will stream video to a web browser using the HTTP communication protocol. The web page will also have buttons for moving the car in the Left, Right, Forward, and Reverse directions, as shown in the image above. It also has two sliders for controlling the camera's flashlight and the speed of the motors.
After uploading the code, disconnect GPIO 0 from GND. Open the Serial Monitor and use a baud rate of 115200. Press the RST button on the ESP32-CAM's on-board RST button. The Serial Monitor ought to show the ESP32-CAM's IP address. Take the ESP32-CAM's FTDI programmer out. You need to access the router's settings. There are a few settings, such as Forwarding or Port Forwarding, that you can change.
The servo's PAN motion is controlled by the Arduino Uno board, on which the ESP32 CAM is installed. This produces a 180° pan motion with steps of 5° every two milliseconds. When the code is uploaded, Arduino powers the servo, which rotates automatically in stages of 5 degrees every two microseconds. automate the esp32 cam's 180° rotation.

The "Port Range" and the "Device" or "IP address" are the two key points to pay attention to in this

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case. You should enter 80–81 in the "Port Range" field. You should choose your ESP32-CAM device under "Device". The IP address of your ESP32-CAM should be used in some routers in place of the device name. The web server will get the live video the camera is recording, and we will use that to control how the vehicle moves.

IV. IMPLEMENTATION

In order to upload code successfully, the Arduino IDE was set up to work with the ESP32 CAM board. A JSON file was installed in the "Additional Board Manager URLs" field found in the "preferences" part of the dialogue box to customise the IDE. Through the implementation of a Local Area Network (LAN), the Wi-Fi configuration code was uploaded to the board. The ESP32 board successfully executes the Wi-Fi code, and it then automatically establishes a LAN connection.

Any Android-powered smartphone, tablet, or other device can do remote operation using a touch screen and a GUI (Graphical User Interface). Commands are transmitted via a search engine device remote at the transmitting end. These commands are used at the receiver end to drive the robot in all directions, including forward, backward, left, and right. They also record the video, which is then transmitted to a TV via RF signal. Four motors connected to the ESP32Cam at the receiving end are responsible for movement.

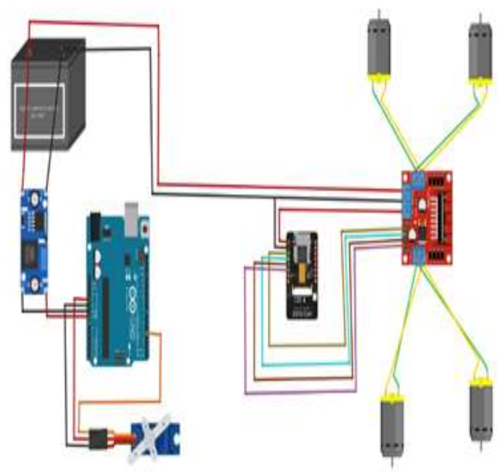

Figure 3: Circuit Layout Design

The ESP32Cam receives serial communication data sent from the search engine and sends it to the microcontroller. The microcontroller's programme makes use of serial data to generate appropriate outputs based on input data in order to drive the motors using a motor driver integrated circuit. The motor driver IC connects the control unit with the motors.

The power supply also drives the Arduino uno via buck converter. Arduino uno thereby drives the servo motor which is connected to perform pan control of the esp32 cam. Due to this pan motion of the servo the ESP32 Camera gets 180º coverage.

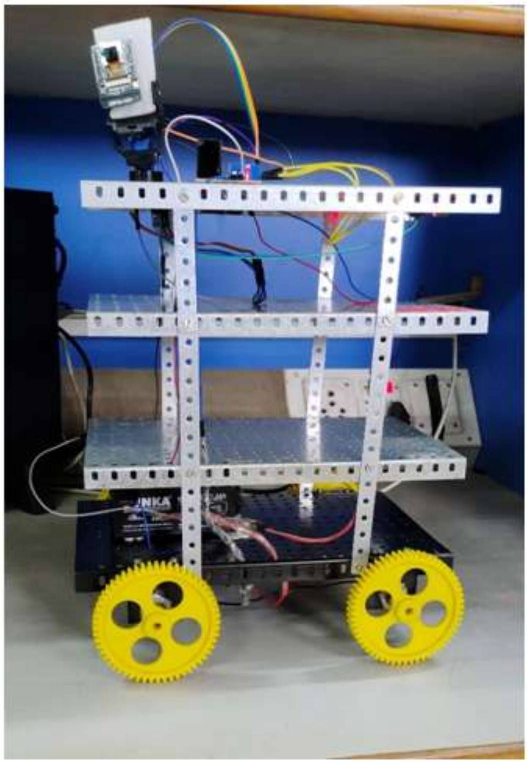

Figure 4: Overview

V. CONCLUSIONS

The wireless video surveillance robot is now operational and can be operated using a mobile device's search engine. Through the use of wireless Bluetooth technology, the web server is successfully used to operate the robot. The Wi-Fi technology on our planned architecture successfully achieves even the real-time video sense.

Sending signals to the robot system is the responsibility of the remote unit. The mobility unit, which comprises of an H-bridge, a motor driver with PWM support, and a motor driver that drives the wheels in accordance with the military motion model used in the system operation, receives the control signals from the ESP32Cam. The robotic vehicle may move in four different directions with this model: forward, right, left, and reverse. The robotic vehicle's visual data is handled by the visual sensor and streaming unit.

The ESP32-Camera, a 32-bit Wi-Fi enabled IoT board with an OV2460 camera with around 2 megapixel quality and more than 30 frames per second, powers this device. With the exception of the ESP32-Camera, which required 5V, the system's power supply provides 12V DC to all of its electronic components. The system was created to operate at a line-of-sight distance of up to 0.5 km and communicate efficiently at a remote control distance of 0.2 km. The movie could be accessible via a Uniform Resource Locator (URL) that could be accessed from any location in the globe with an internet connection thanks to the ESP32-Camera's role as a web server. In practically every sector, surveillance is necessary. Our idea has a huge scope because it makes use of the most recent technology available on the market, and it might be a fantastic answer to a variety of issues or situations where wireless surveillance is required. Solar cell deployment as a means of battery charging and control mechanism establishment to ensure smooth, stable operation of the robot at any time can be used to further improve the robotic system.

REFERENCES

[1] Phey Sia Kwek, Zhan Wei Siew, Chen How Wong, Bih Lii Chua and Kenneth Tze Kin Teo Development Of A Wireless Device Control Based Mobile Robot Navigation System 2012 IEEE Global High Tech Congress on Electronics.

[2] Article ID 197105 Indoor Surveillance Security Robot with a Self-Propelled Patrolling Vehicle Volume 2011.

[3] Pavan.C, Dr. B. Sivakumar Wi-Fi Robot For Video Monitoring Surveillance System International Journal of Scientific Engineering Research Volume 3, Issue 8, August-2012.

[4] Abdulkareem, S. A., Arif, A.Q., Ahmed, R. N., Ahmed, A., Amjad, J. H., Ibraheem, K. I. (2021). Embedded Design and Implementation of Mobile Robot for Surveillance Applications. Indonesian Journal of Science & Technology. 6(2), 427-440.