Camouflage Technique Based Multi-Functional Army Robot

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ABSTRACT: *These days, many expenses are incurred in the field of safety in accepting basic safety labour to monitor the boundary from intruders. Some defence organisations employ robots to assist them in risky areas where reinforced force members are less effective. The camera, sensors, location, and videotape screen are the only devices these Army robots may access. The main goal of our framework is to include certain redundant factors, such as a Wi-Fi module for continuous information generated by the camera at the recording screen and PIR sensors to track the invader, along with some covered questions. As a result, the suggested framework using Wi-Fi reduces guard faults and maintains the state safe from the enemy. Cover Robot plays a key role in preventing person losses and the dangers associated with crises. As a result, it will become more significant in the future.*

KEYWORDS: Camouflage technique, Internet of Thing, Haar cascade algorithm, IR Sensor, Ultrasonic Sensor.

I. INTRODUCTION

Primarily, Army Robot is suitable for performing tasks like locomotion, sensing the dangerous gas, sensing the humans beneath the surface, mineral spotting. Army robot is an autonomous robot comprising of wireless camera which can be used as a spy and Bluetooth used to control it wireless. The existing systems suffered many problems like high cost to set up communication between robot and rescue control unit, noisy wireless communication link between robot and control unit which ultimately stopped robot to function etc. In these systems, distance is a limiting factor because the Bluetooth has a specified range that cannot be increased. The purpose of the camouflage robot is to minimise casualties during military operations and terrorist assaults. Since it is exceedingly difficult to be seen by the naked eye, it serves as a virtual spy and may be dispatched into important military key sites for surveillance and combat purposes. Agriculture may also make advantage of the camouflage robot. In order to keep the region safe from intruders and protect the crops from animals and birds, agricultural land monitoring is crucial. In defence and rescue missions when human access is not feasible, camouflage robots are deployed. The camouflage robot buzzer is an alarm device that can be integrated into many security systems and activates upon spotting unknown faces.

II. EXISTING SYSTEM

Army Robot is primarily designed to carry out tasks including metal identification, motion detection, harmful gas detection, and people detection below the surface. A fortified force robot is a standalone machine with a remote camera that may be used as a government agent and Bluetooth for remote control. manned border crossing security Soldiers only manage the Defense structure. Current is captured using a sensor-less system that

relies on regulators integrated within the Raspberry Pi. Without an IR sensor, it is unable to detect precise movement. It is advantageous since it provides unwavering quality and security on both sides. For this assignment, we are use a Raspberry PI. Any advancement in a region that is thoroughly assured, for instance, by applying automation, is a zone.The robotization is a sensor-based framework with a focus on any living things that are within the sensor's range. The gun's programming, which is based on IR sensors and cameras, is crucial. Up to that moment, the perimeter was completed by Iron Spike wires and a watch tower from which a person would continuously shine a light over the perimeter at all hours of the day and night.

III. LITERATURE SURVEY

The most important phase in the software development process is the survey. One method of empirical inquiry that allows researchers to gather data from a wide population is the survey. The survey's primary goal is to generalise the results[18][19]. The survey method presents the investigators with a variety of challenges. Survey results are also influenced by factors including sample size, response rate, and analytical techniques. Therefore, there is a need for literature that covers all potential issues as well as the influence of survey factors on results.
Sustainability enabling methods for development of border security systemsEnhancing information interchange, fortifying information systems, and stepping up security at the EU's external frontiers are some of the top goals for a successful and long-lasting Security Union (EU). Recent research initiatives that have received funding from the EU under the Security theme calls are focusing on the development of cutting-edge concepts and technologies, either for border surveillance and control or for improving IT&C interoperability and creating a more supportive environment for law enforcement agencies. The goal of this article is to verify particular novel Research Development (R&D) scheme types as sustainability enabling research approaches for the development of integrated border security systems. These scheme types include pre functional validation and pre-commercial procurement.In this regard, the report uses the feasible development description developed in earlier research and offers some particular general Key Performance Indicators (KPIs) Measures of Effectiveness (MoEs).

Jayanthi N and Indu et al suggested techniques for Image Matching Comparison. Various picture identification and tracking algorithms that operate on different datasets were proposed. The datasets picked cover a wide spectrum, including hand motions, forms, objects, and handwritten manuscript language. The Blob detection technique, Template matching algorithm, and S.U.R.F Algorithm are the algorithms whose performance is being evaluated. Each picture is recognised using a specific set of characteristics, and all three are fast, flexible, and invariant to rotation, scale, and lighting. These characteristics are unique to each image and aid in identification after the fact.

Robot with Color-Changing Camouflage Hitesh Shinde, Kirti Sonawane, Pranit Rane, Atharva Pathak, and SumitaChandak, 2020: The survey found that the examined systems. The solution for decreasing human mortality by substituting such operations is the camouflage robot. The suggested system comprises of two cameras, one for surveillance and the other for colour sensing. Through this camera, the robot detects the hue of the surrounding area and adjusts its colour to blend in. This makes it difficult to be seen by an adversary's unassisted sight. Wireless Trans Receiver is used to link them, and the system is remotely operated using a computer. It analyses the surrounding surroundings and shows the spectator live video.

Fast Color Transfer for Camouflage Applications Long Bao, Karen Panetta, SosAgaian,2017
In this paper the author proposed a color transfer algorithm Color transfer technique have been extensively developed tomanipulate color information of image data in numerous operations. In this paper, color transfer investigation is presented forcamouflage operations, along with the challenges facing numerous state- of- the-art colors transfer methods.

identification of hidden moving objects Sanjeev and Kiran Shah, Archana Rajesh Date, 2018:
In this review article, multiple methods for detecting moving objects that are disguised were suggested. Spotting moving objects is a crucial and significant phase in any operation using videotape surveillance. Advanced level activities like tracing, event detection, and behavioural analysis have used the detected item as an input. The military's use of camouflage moving object detection has drawn academics' attention in recent years. Finding a moving object is the first stage in any operation to extract information from videotape surveillance.

IV. PROPOSED SYSTEM

One camera serves as both a surveillance and color-changing camera in this setup. This means that this robot is difficult for enemies to notice. This robot is still capable of infiltrating hostile territory and sending us video footage. The ability to move is managed by IR sensors. This design runs solely on batteries. Interactive and stir Discovery are the two modes. You may operate the turret remote and aqueduct live video in interactive mode. Stir Discovery tracks moving targets in front of the camera using open CV and computer vision. One colour sensor camera serves as a cloaking point in the proposed system, while another camera is used for surveillance. The robot's color-sensing camera changes its colour in response to the colour of the face. Soldiers were solely responsible for border protection up until this point. The soldier spotted the enemy and turns his attention to him in the largely protected area. Therefore, a microcontroller-based camouflage robot is proposed to increase security. This disguised robot's first goal is to protect the border via automation, which will lessen the serious issue. Face recognition is used to authenticate individuals. The recognition system may accept natural alterations in an existing person's facial expression. Incorporating star element analysis (PCA), one of numerous techniques to face recognition, into our design. A database with a collection of face patterns for each existing person makes up the system. The stored pictures used to train the system for later recognition of fresh photos are where the distinctive traits known as "eigen faces" are taken from. Color-based algorithms are employed. It can be photographed or weighted from a previously snapped image in memory. Read the input image in RGB format, which is the most popular format for displaying multicoloured images. If the image's resolution is MxN, the RGB format will also be a three-dimensional matrix with a size of MxNx3, where each dimension of the matrix represents the red, green, and blue colour components of the image.

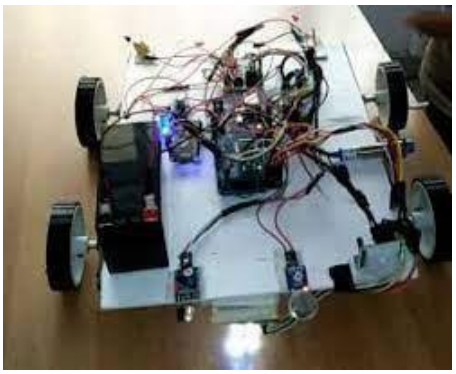

Figure 1

VI. Methodology

The robot has finished both input and output, in contrast to the PC, which has completed all picture processing. Robot gathers the information needed for processing using these input devices, including a color-sensing camera, a video feeding camera, and an obstacle sensor. The data is subsequently wirelessly sent to the computer via the Wi-Fi transceiver. The computer then uses a variety of image processing techniques to process the supplied data. It determines the colour of the background and informs the robot about it. Using a PC, the user may also direct the robot to move. One of the most important jobs of the PC is to show the live video stream from the robot. The entire transmission is carried out serially using a Wi-Fi trans- receiver. The robot can output the colour it has received by changing the colour of the LEDs covering the chasse. Frequently, one of the robot's three relays is turned on to do this. the device that will be used to direct the robot's motion.

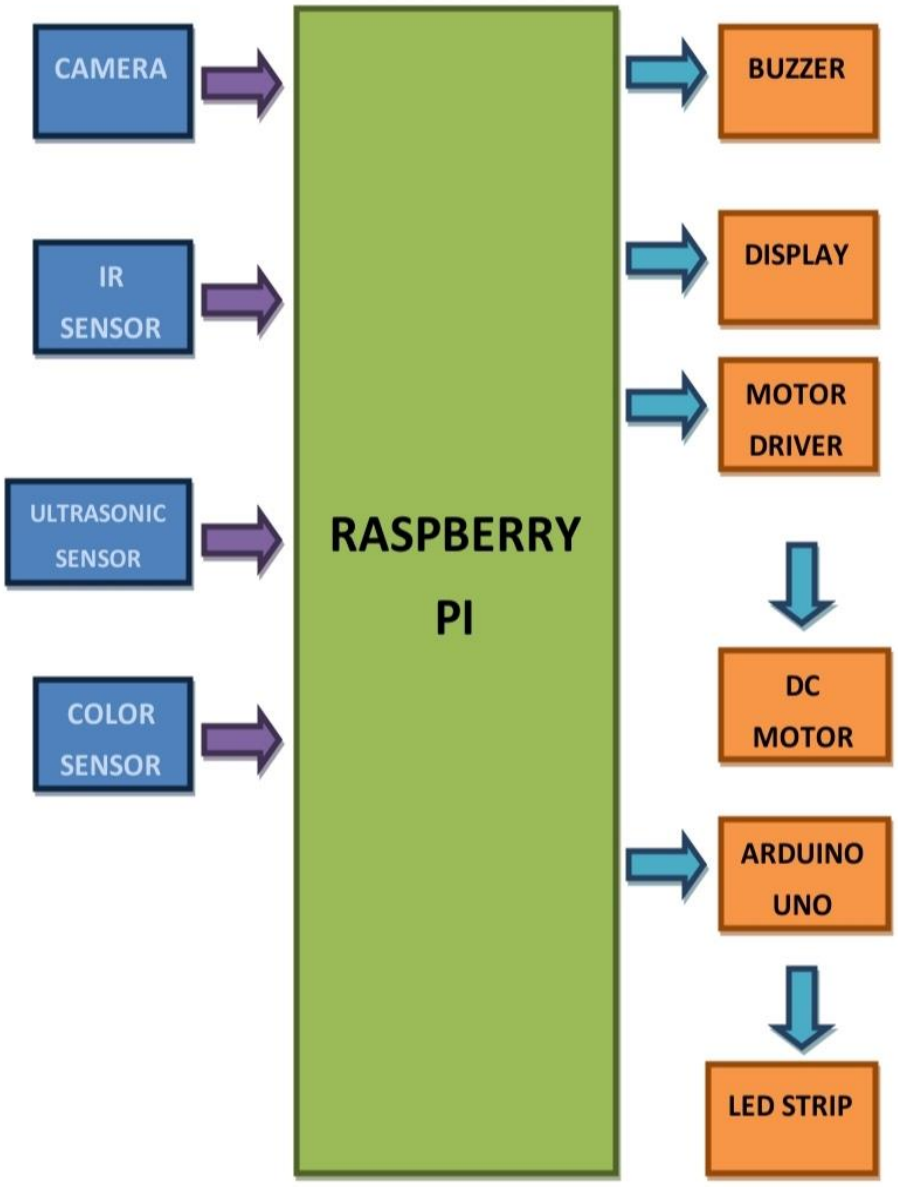

Figure.2. Block Diagram of Camouflage Technique-based Multifunctional Army Robot

VII. Results

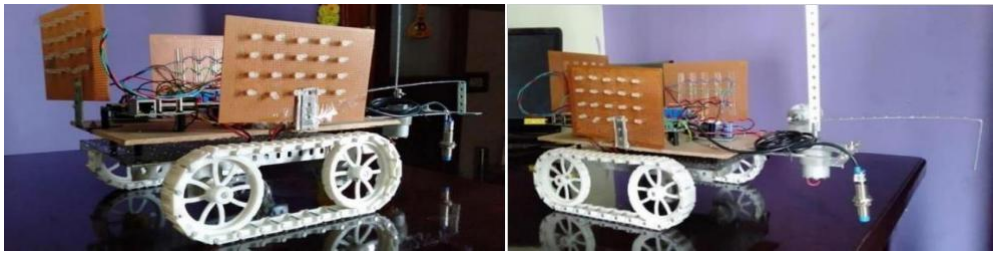

Figure.3. Prototype Model of Camouflage Technique-based Multifunctional Army Robot

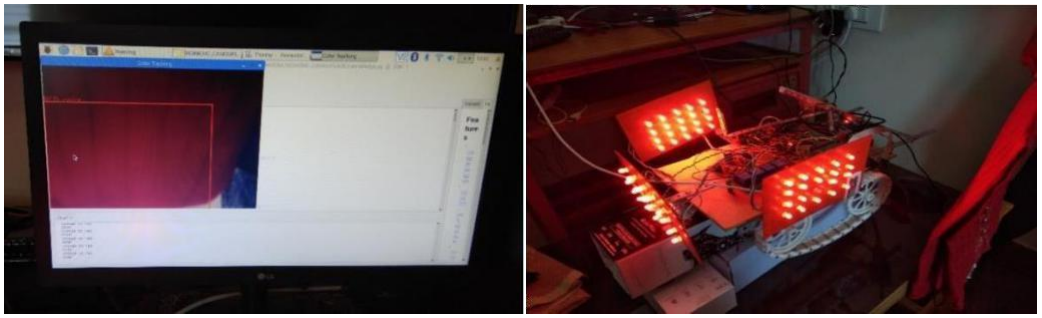

Figure.3.1. Based on the Camera input the Color of the LEDs changes to RED

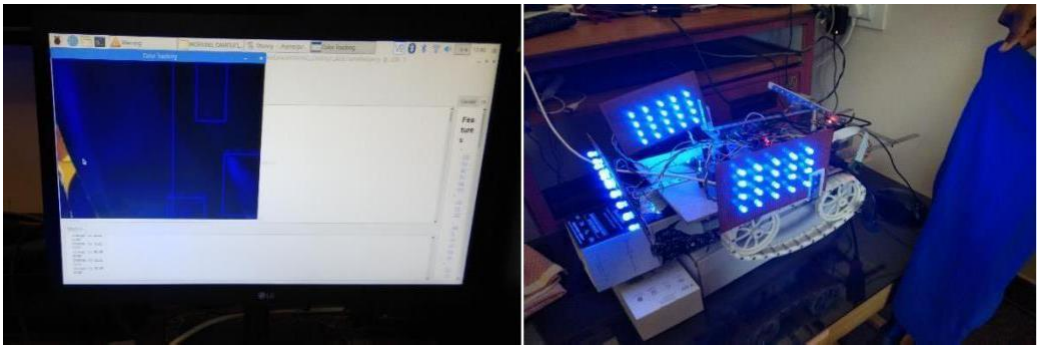

Figure.3.2. Based on the Camera input the Color of the LEDs changes to BLUE

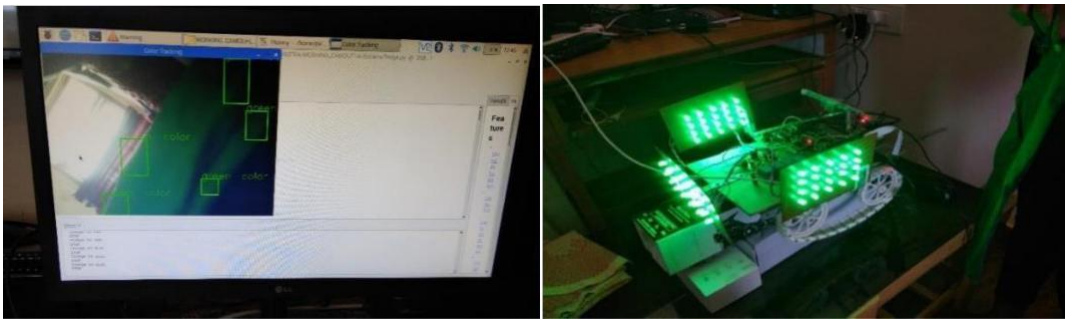

Figure.3.3. Based on the Camera input the Color of the LEDs changes to GREEN

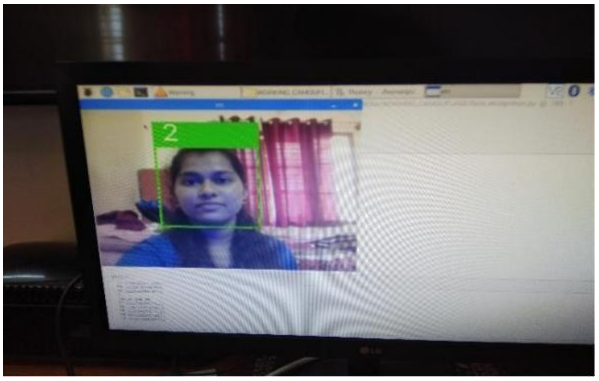

Figure.3.4. Recognition of known faces from the data

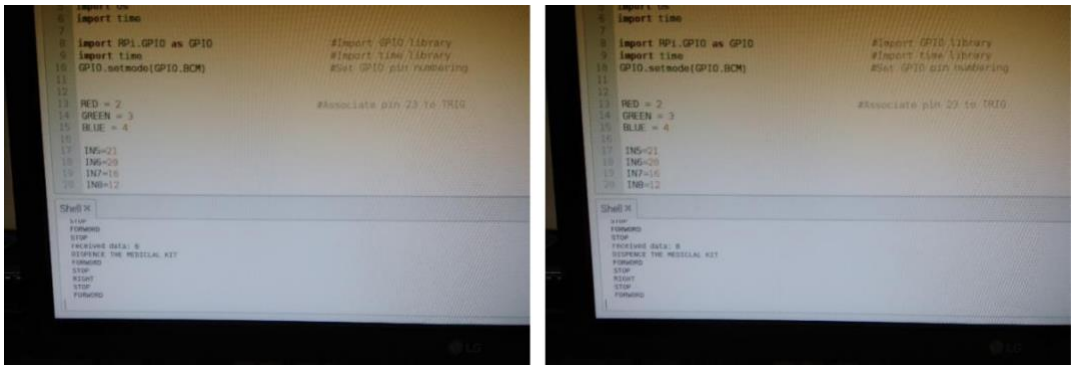

Figure.3.5. First aid box delivery to the destine

CONCLUSION

The suggested mechanism would replace human life. This proposed robot serves to operate as a security system and also a liberator because human life is always given higher priority. It performs and serves a crucial function in keeping an eye on the battleground regions and capturing the surroundings. The robot conceals itself from enemy sight by changing color in accordance with the environment since it is based on the chameleon's ability to change color. In addition, the camouflaging characteristic makes it challenging to see the robot with the unaided human eye. Overall, the proposed technology aids in the detection of intruders by our security officers. Robots are also useful in high-altitude environments where people cannot survive. The Ultrasonic Transceiver (Transmitter & Receiver) locates the missile object and, using a microcontroller, displays the missile direction on an LCD. When one of the ultrasonic sensors detects the missile, a buzzer sounds to warn others around.

FUTURE SCOPE

The main goal of our project is to control a robot using a PC. This system can be modified to make use of a PIR sensor, which stops the device and sounds an alarm if it detects any human presence in its path.The controller can be designed so that the robot moves intelligently based on the key that is depressed. We can retrieve the status of an operating robot by using the GSM module. Additionally, an ultrasonic module is an option can be used to identify obstacles with a GSM module that provides the appropriate information. This robot can be use at manage all scenarios and a variety of disciplines. For instance, by attaching a bomb detector to a robot, we may send it anywhere (such as a battlefield, a forest, a coal mine, etc.), where it will identify the bomb on the field and transmit data to a server or control room. Instead of sending someone to check on the temperature in a dangerous area, we may monitor it from the control room by adding a temperature sensor to the robot. This algorithm can also be enhanced to determine a person's gender or to decipher their facial expressions. The detection of living bodies can also be done with this method. In the future, this system can be improved with the aid of Bluetooth and GPS technologies in order to function more effectively.

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