Multipurpose Military Spying and Bomb Detection Machine

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Abstract:- In this paper, an innovative system is designed for multiple roles and combined with intelligence on a single platform. To tackle the continuous attacks, wars or threats in war fields we are preparing a movable machine. In this system, Raspberry Pi 3B+ is a main controller equipped with various types of sensors such as Metal sensor, ultrasonic sensor, smoke sensor, flame sensor, to detect the parameters. Camera is used to capture the real time images of the object or intruder. This system can send us the information of military area through the alert message and location.

Keywords:- Raspberry Pi 3B+, Metal Sensor, Ultrasonic Sensor, Smoke Sensor, Flame Sensor, Camera, Alert message, Location.

I. INTRODUCTION

A Multipurpose Military Spying and Bomb Detection Machine is the advanced technology that represents the design and implementation of the machine for the military applications and security purpose. It plays crucial role in the security domain. The machine is programmed to autonomously navigate through the terrains and identifying threats using Machine learning algorithms.

The heart of the system is Raspberry pi 3B+. Various sensors such as Metal sensor is used to detect bombs and mines, Smoke sensor is used to detect the smoke or gas leakage, Flame sensor is used to detect the fire, Ultrasonic sensor is used to detect the distance between machine and object. The camera is provided to capture real time images of the unknown persons or the objects. The Haar cascade Algorithm of Machine Learning is used for the classification of the image which functions on positive and negative images for the detection purpose. In order to train a classifier that can eventually be used to detect faces in real time, a large number of images, both with and without faces, are used. Android application is used for the movement of the machine[1-3].

When the parameters such as smoke, gas, fire, bomb, unknown person or object is detected then buzzer will be on. The alert message and E-mail with location, distance and image is sends to the authorized person [4-6].

II. LITERATURE SURVEY

Shruti Vasanwala, Dhrumil Patel, Balbhadran Prajapati, Riddhi Odedra, Prashant Sahatiy, "Military Spying and Bomb Disposal Robot". This paper presents a robot system for disposing of bombs that is operated by an Android application. The system includes a metal detector sensor, a robotic arm, and a night vision camera. Commands for moving forward, backward, right, and left can be used to control the robot. The arm can also be moved to handle objects. [1].

Priti Khokarale, Sheetal Bangar, Atharv Lohakare, Sangeeta Patil, "Multipurpose Military Spying Robot". The system's main concept is to use a Bluetooth module and an Android smartphone to remotely control a mine disposal robot. The robot has a metal detector for bomb detection, ultrasonic sensors for obstacle detection, and a night vision camera for recording and viewing [2].

Nandgopal Rathod, Puneeth. G, P. Brahmaiah Sandur Gangadhar, Gururaja Sharma.T, "Advanced Spying and Bomb Disposal". The robotic system is remotely controlled, it uses a car, a robotic arm, and a camera to record the environment, navigate hazardous areas, and operate objects. An RF remote is used to operate the system and move the arms [3].

Sarmad Hameed, Muhammad Hamza Khan, Naqi Jafri, Adeel Azfar Khan, Muhammad Bilal Taak, "Military Spying Robot". In this paper robot is small size with PIC 16F628A and PIC 16F877 makes it perfect for covert missions. To make sure it doesn't get lost, the robot uses a transmitter for manual control and a camera to transmit back real-time video [4].

Anita Jadhav, Prachi Jadhav, Pooja Magdum, Kiran N. Patil, "Spy Robot for Military Application Using Wi-Fi Module". A smartphone-controlled Wi-Fi robot is suggested in the paper. It streams live video to the user's smartphone GUI using an IP camera. Through Wi-Fi, the phone receives the camera feed and manages the movement of the vehicle [5].

Nikhil Sidhwani, Tarun Miran, Dolly Dhanwan, Assist Prof. Manisha Joshi, "Intelligent Spy Robot". The project proposes the use of a spy robot in hazardous environments. It has an LCD for encrypted messages, live streaming for situational awareness, and an obstacle detector for self-preservation. The device makes use of embedded systems [6].
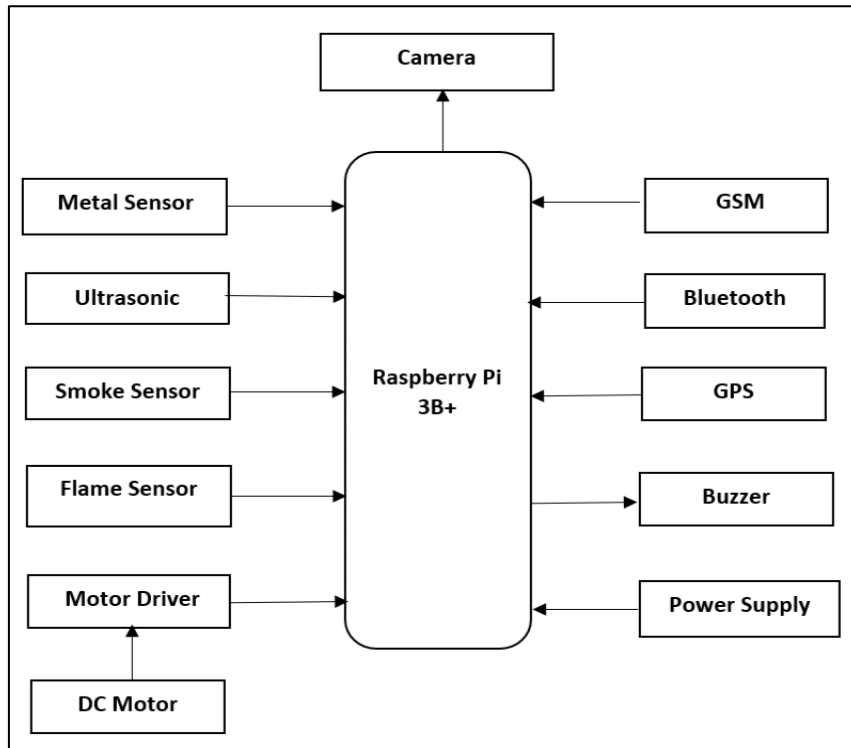
➢ *Block Diagram*

Fig. 1. Block Diagram of System

III. WORKING

The above figure represents the working of the System. Working involves a combination of hardware part, software part, and sensing technologies. The raspberry pi is the primary controller of project. The Machine possesses variety of hardware's such as Camera, metal sensor, gas sensor, flame sensor, ultrasonic sensor, Bluetooth module, GSM, GPS, motor driver, and DC motor. It has the advanced feature receiving command from military operators and transmitting data back to the military [1-2]. The machine is navigating through Bluetooth Terminal android app. The machine is moving forward backward and left right using motor driver and DC motor. Whenever the ultrasonic sensor detects any object, the camera will be ON. Then the picture will be captured through that camera. And then the system will check if the image is positive image or negative image. The image is positive or negative is recognized through Har cascade algorithm of machine learning[3] . Our system has already saved some positive and negative images. Positive images are the known human faces and negative images are all other than known and unknown human faces. Known faces are the pre-registered faces which are allowed and authorized person in the military field. If the unknown face is detected then that picture will be sent to the military operators through the mail. Ultrasonic sensor is also used to detect distance between detected object and the machine. Here we are using different sensors for detection of threats. The metal detector will detect the bombs and mines and gas sensor will detect the gas leakage and toxic gases in the environment. Flame sensor detects the fire and these all features will reduce human harms. Whenever the sensors detect the objects or threats the buzzer will be beeped and the alert message will be sent through the mail. That alert message contains the location where treat detected. The location is tracked using GPS[4] .

Raspberry pi has a set of GPIO pins which are used as a digital and analog input/output pin. We have to connect various terminals of sensors to the appropriate GPIO pins. The connection is depended on type of sensors. The connection involves power (3.3V or 5V), ground (GND), and data lines. To communicate with the sensors, we have to install the necessary libraries and packages on the Raspberry Pi [5-6].
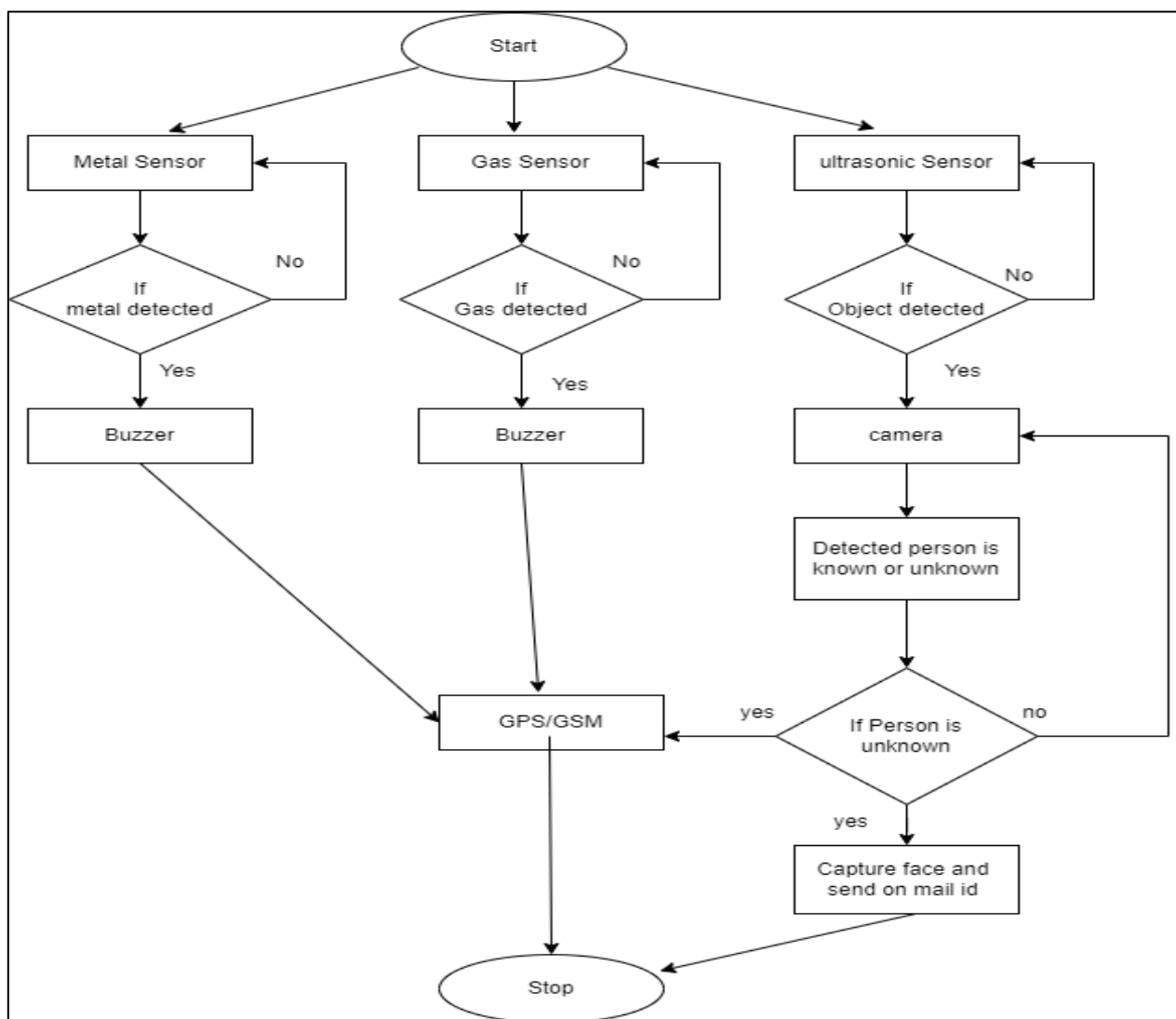
➢ *Flow Chart*

Fig. 2. Flowchart of System

➢ *Advantages:*
• Multipurpose Military Spying and Bomb Detection machine can perform a variety of tasks including detection of fire, gas, smoke, bomb, smoke, unknown person and can provide real time footage.
• By automating certain tasks and combining multiple functions into a single platform, multipurpose machines can reduce the need for large manpower.
• It reduces the need for separate equipment which can save on costs.

➢ *Disadvantages***:**
• They rely on specific network and facilities.

➢ *Applications:*
• Machine have cameras and sensors to see what's happening in the campaign and surrounding area.
• Used in finding bombs.
• It can detect fire or area with high temperature.
• Each sensor a specific role, working together to enhance security, detect threats and aid in rescue missions as needed.
• It provides location data of unknown person who's detected by camera and send alerts to nearby unit.
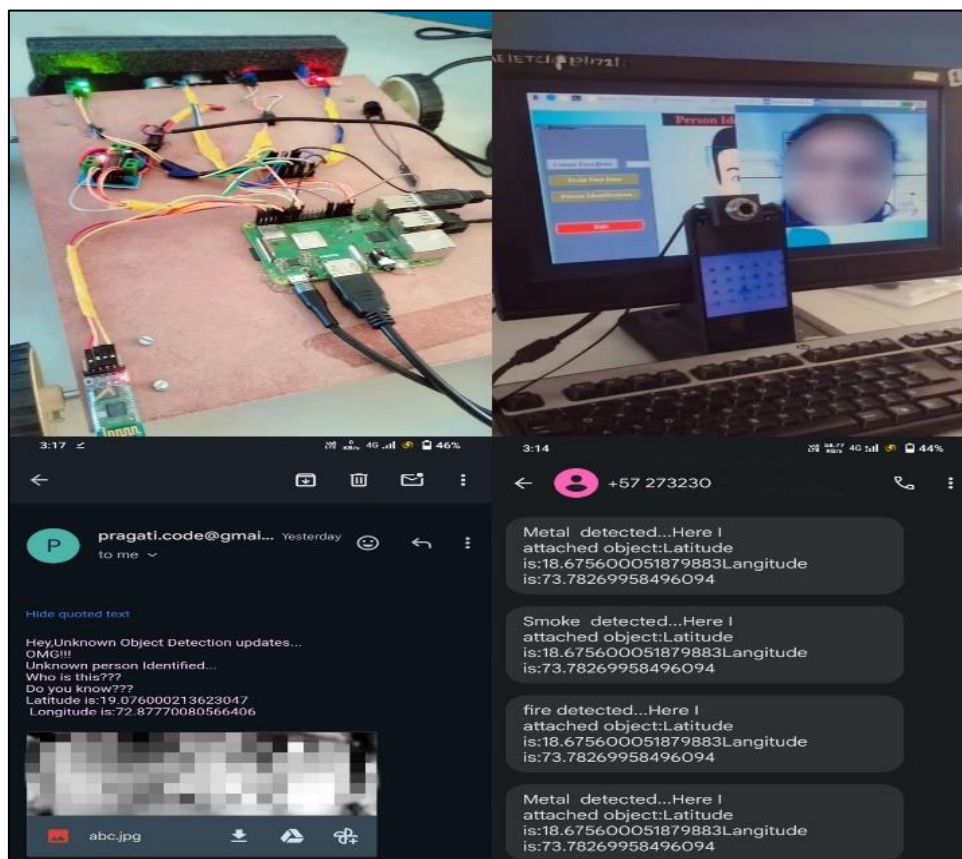
IV. RESULT

Fig 3 Result

V. CONCLUSION

The development of a multipurpose military spying and bomb detection machine equipped with camera for identifying unknown object represents a significant advancement in security and defence technology. Through its advanced sensors and detection capabilities, including the identification of pinpointing locations, detecting fires, smoke, and metal. The robot provides invaluable support to military personnel in assessing threats and responding effectively. With its ability to reduce human exposure to potential hazards and provide real-time data to operators, this robot enhances personnel safety and efficiency in diverse and challenging environments.

FUTURE SCOPE

In future, Multipurpose Military Spying and Detection Machine may gain more intelligence with AI, allowing them to operate more independently. In addition, it could be better at seeing and sensing things, such as faces and different types of danger also predict situational attacks. Along with the military, it could also be used in disaster response.

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