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Location Indication and Night Vision Cameras in Fire Detection Robot

Neha Sultana[1], Aksa Rani[2]
[1](M. Tech student), [2](Asst. Professor), Department of Electronics and Communication Engineering, MallaReddy College of Engineering

Abstract: The human machine is the robot of the firefighter, though there are an unprecedented amount of deaths during the fire killing process. The main aspect of this robot is to feel and travel to the fire automatically, to extinguish the fire through water from a safe distance.. This robot can be entirely monitored by a programmable Arduino/Raspberry-Pi. It goes straight on, east and front and back and can identify and extinguish the fire, and is located in the place of a bus. The GSM/GPS unit, an infrared camera and a thermal camera are connected to the fire fighter robot. The thermal camera's job is to change fire and temperature and to provide a live night vision to capture the whole phase of extinction. This live recording can be included in the programming guide, even fitted with a computer setup.

Keywords: Raspberry-pi, Sensor, GPS, GSM, DC Motor, Cameras, RF receiver.

I. INTRODUCTION

The purpose of the project is to create a Night Vision camera robot to fight fire from the remote and remote activity. A robot prototype that can push and extinguish fire by using water will be developed. The usage of this robot is supposed to measure if the high temperature of fire is being differentiated during which the water system cancel the fire. This robot would remain far removed from the operating area in quest of flames with vulnerabilities. This robot is entirely controlled by its programmable raspberry pi development and actions. The pi is planning and carrying out all types of flags to complete the robotic task. Through carrying out random inventions, Robot can screen the work area and is used by humans in particular for battling flames. A water tank near a siphon requires a vehicle that if appropriate, throws water.The Raspberry Pi manages the engines for vehicle output through a driver IC in the center of the receipt of information instructions. This robot body is fitted with a thermal camera fire warning and an infraroad camera which can record live extinction.

It is because anywhere this camera is taken, a sign of the device will be used to equate the PC. The robot resides in the 2-meter blowing radius. Via the water tank linked to the body of the robot, this structure soothes flames from a sheltered separation.

II. EXISTING METHOD

Several remote rescue and firefighting agencies have successfully developed and delivered firefighting robots. The execution of robotics is incomplete in any situation. They measure and assess them from two angles: 'size and weight' and 'cost and efficiency.' Firefighting is a crucial mission, but it is a very risky occupation.

A. Rolly Robot Fire Fighter

A robot to combat a burn in a restrained base of the building is supposed to flash the fire (by putting a container over the LEDs) and then enter the property.

B. The Robot For Fire Safety

This robot was built to travel to a chamber to look for a spot, perhaps due to a burn, where outrageous warmth happens. Upon joining the business, the robot uses the shading camera to find a picture close to the detailed centralization of the blaze. The temperature sensor is initiated as the robot heads to the flame to search for a significant quantity of water. The fan is turned on with a servo motor, to quickly extinguish the sun, in case of excess of high warmth.

C. Fire and find Responses: Autonomous robot Smartphone

The aim of this project is the improvement of a lightweight robot that can drive and control a multifunctional robot. The robot gains tremendous knowledge on the path and the potential to feel and subsequently smother a wild fire. The robot is programmed fully by a PlC microcontroller and is provided as a driver for CD engines and other electronic components by RC circuits.

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III. PROPOSED METHOD

The technique employed by the project is the agile methodology. The suggested rescue mechanism would enable the fire to be identified promptly prior to shutting off. This approach contains two project scopes well-known for their consumption and scope for robotics. From the customer's point of view, the consumer will locate and extinguish the fire from the robot as a user and view the live footage of the whole fire-extinguishing technique. The aim of the robot is to keep the whole extinguishing process secure. The robot system also provides direction and power to extinguish the flames. The architecture of the robot allows it possible to create inverted 360 swivel units and also to change these.

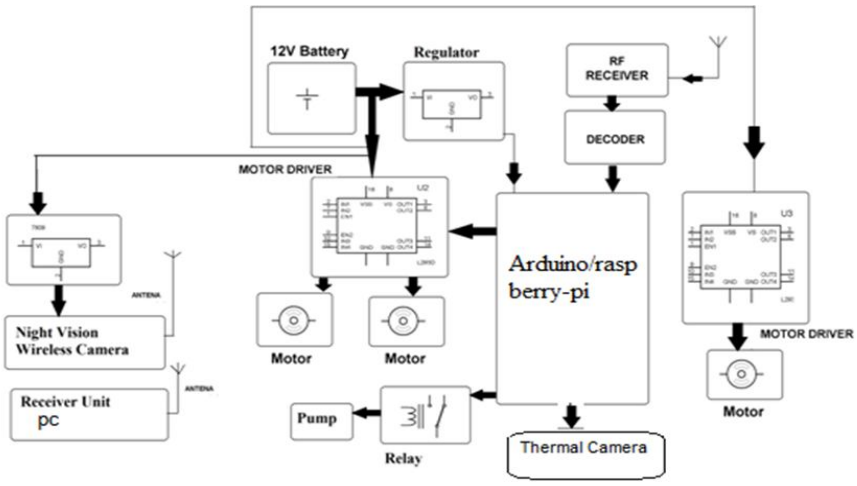

Figure3. Block diagram

The Raspberry PI operating system comprises a software which produces with the Night Vision camera the first Fire Fighter robot frame pi. The use of raspberry pi is that it is used as a creative action to senses the flames, so that a robot may travel anywhere when correct codes are added. For the whole extinction procedure, there is also an IR Thermal Sensor Pi camera.

IV. COMPONENTS USED IN ROBOT

A. Raspberry-PI

The Raspberry Pi is a portable one-board machine. It functions as a mini-personal computer by attaching peripherals such as the keyboard, mouse, and display.

The Raspberry Pi is used for image/video, IoT-based software and robotics in real time.

Slower than laptop or desktop, however, Raspberry Pi is also a device which offers many of the anticipated features or features for low power consumption.

The Debian-based Raspbian OS is formally provided by the Foundation Raspberry Pi. Raspberry Pi also supports NOOBS Apps. We can load various OS variants from third parties, such as Ubuntu, Archlinux, RISC OS, the Windows 10 IOT Center, etc.

The Raspbian OS is the free-to-use official operating system. This OS is designed for Raspberry Pi usage efficiently. Raspbian has a browsing gui, programming Python, workstation, games, etc.

An Iso SD card should be used to carry the Iso (minimum 8 GB recommended) (operating System).

It provides connections on the chip with the circuit, i.e., more than just a device. GPIOs for program deployment. By connecting to GPIO, we can link and monitor devices like LEDs, engines, cameras, etc.

The Broadcom SoC ARM-based processor has a GPU on-chip (Graphics Processing Unit).

The processing rate with a CPI variations of between 700 MHz and 1.2 GHz. The SDRAM has a 256MB to 1 GB on-board.

Raspberry Pi is also supplied with on-chip modules for SPI, I2C, I2S and UART.

B. IR Thermal Camera Pi Camera

Hot springs are like standard springs cameras, utilizing light to capture photos. The most distinguishing feature is the selection and examination of lighting by thermal sensors to define the infrarot component, not the noticeable field. Soon after the association between radiation and the heat generated by black bodies was observed, infrared detectors were found as a way to estimate

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temperature using non-contact instruments. Infrarouge detector has been omnipresent over recent decades, with integrated circuits declining in size as well as in non-distructive science, surgical equipment innovations and motion detector applications. A 768 pixels (24x32) thermal cameras is a sensor used here as an MLX90640 [data sheet]. It uses a variety of infrarot detectors to classify the object-generated radiation (and possibly filters). The MLX90640 can be used with a Raspberry Pi machine to monitor and collect extremely high resolution temperature charts. By interpolating the MLX90640 to output a 3 frame-by-second (fps) thermal camera at a 240x320 Pixel size, we can drive the RPI to its limits using Python.

V. RESULT AND CONCLUSION

The Night Vision Camera Fire Fighter Robot takes charge of this fire extinguishing water tank and water pump from a safe distance during this mission, so that the robot cannot be hurt. The login reference of the robot framework. For a login screen, a user name and password are needed, the individual shall only scale the boot or unlock it. A control page that indicates the live recording is operating an internet gui. Control buttons such as video recording, image retrieval, time and activity monitoring, robot acceleration, robot stoppage, restarting unit, stopping cameraFrom a secure place, the tactic of the fire-fighter robot see the fire and throw water on the fire to quench it. Then the fire robot extinguished the fire from a reasonable distance with the water.

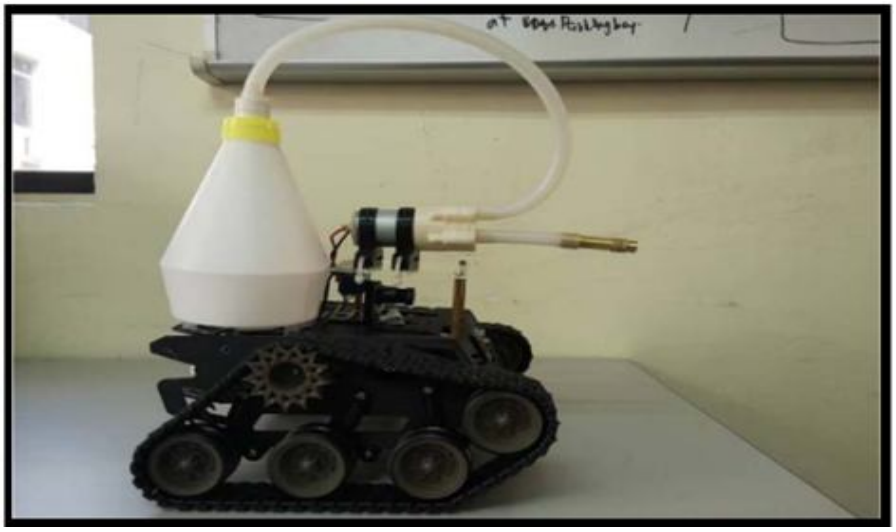

Figure4. The end result of robot

Figure5. Method to extinguish the fire.

The login interfaced of the robot system is displayed in figure 5.username and password are needed for the login page; only it can the user operate or trigger the robot.

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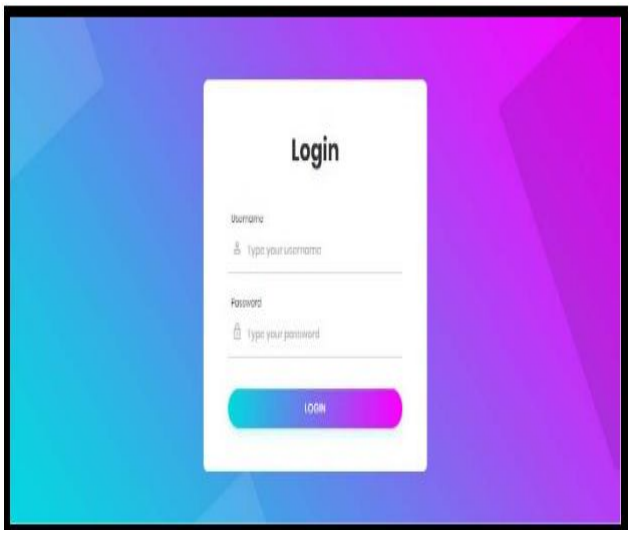

Figure 5: Login page interface

The control page gui that displays the live recording activities as seen in figure 6. Monitor keys such as video capturing, image capturing, time-lapse, and motion recognition, robot driving, robot stopping, machine restart, and camera stopping.

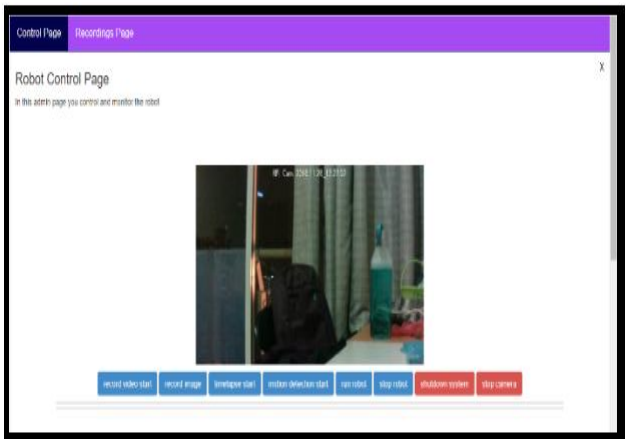

Figure 6: Control page interface

The recording page gui that displays all stored videos and collected photographs from the control page is shown in Figure 7. This system design often includes choices for displaying stored videos and captured images, such as opting to erase, zip, lock and unlock.

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VI. FUTURE SCOPE

This paper includes Manual-controls to trigger the 2-types of pump which are fitted to the outline of a fire and which can be automated through studying how to maintain the robot. Considerations such as structure A may be calculated with the volume of carbon dioxide that the CO2 pump begins immediately so fire B possibilities are represented. A way of locating electrical fires can make it more possible to add water in real time for extinction purposes since it will provide electrical shocks for persons, while employing other approaches other than flames.

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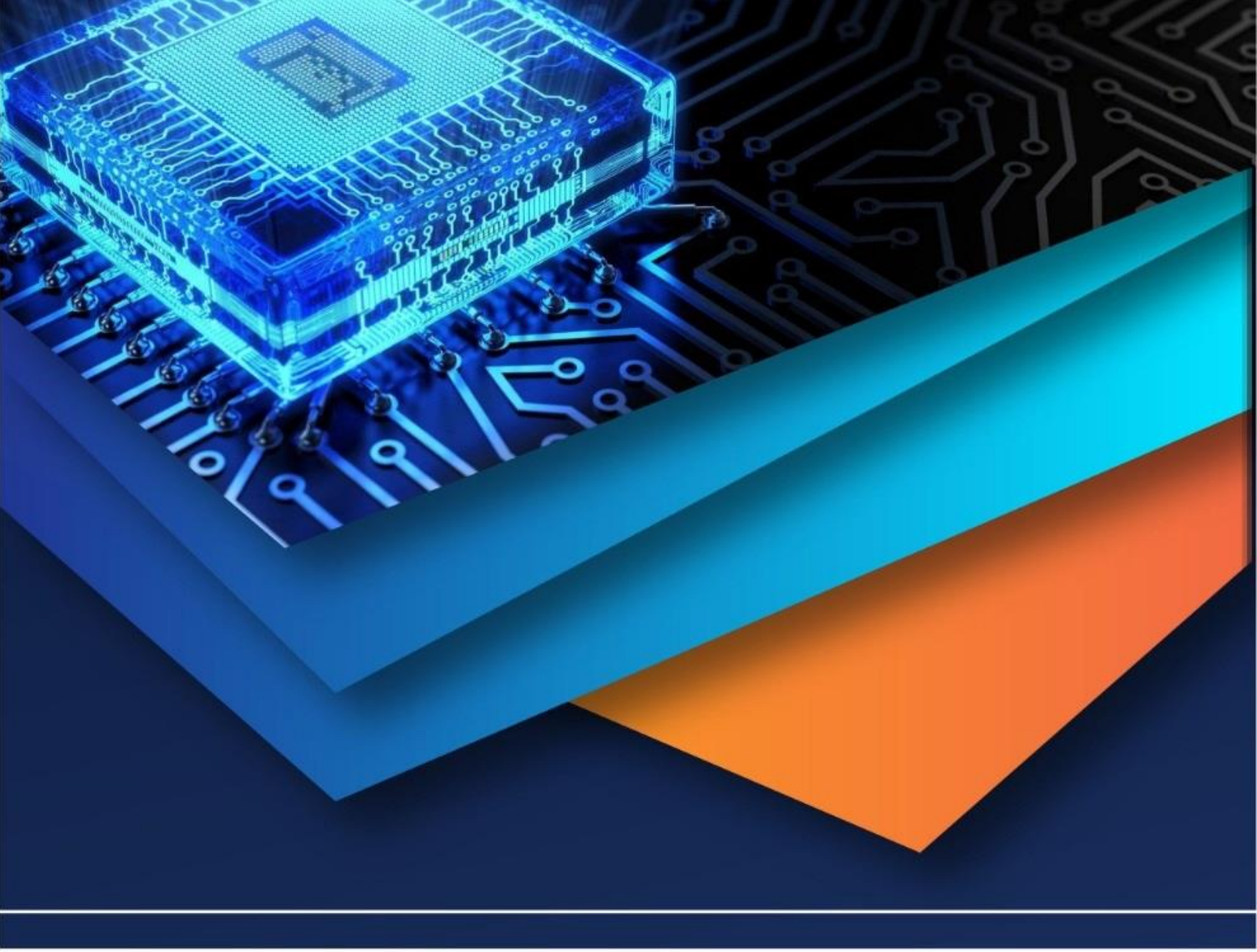

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