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IOT BASED FIRE FIGHTING ROBOT

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ABSTRACT

Fire accidents have been occurring frequently these days, with or without the intervention of humans. A fire incident is a disaster that can potentially cause the loss of life, property damage, and permanent disability to the affected victims. Firefighters are primarily tasked to handle fire incidents, but they are often exposed to higher risks when extinguishing the fire, especially in hazardous environments such as nuclear power plants, petroleum refineries, gas tanks, etc. They also face other problems, especially if a fire breaks out in a small, cramped area, as they need to explore the ruins of buildings and obstacles to extinguish the fire and save the victim. In the case of high barriers and risks in firefighting activities, innovation can be used to assist the fire brigade. When the Robot detects a fire, it gives a message to the nodeMCU which will automatically sense the fire update the data on to blynk server and control the robot and start the water pump. It assists firefighters in extinguishing the fire. And it will perform its operation where firefighters can’t reach. This will save the risk of fire fighters' life and avoid any further damage.

INTRODUCTION

In order to put out fires and preserve lives, firefighters must be experienced and trained to enter dangerous places. This is a risky and difficult work. To improve the security and effectiveness of firefighting operations, firefighting robotic vehicles have emerged as a potential alternative thanks to recent breakthroughs in robotics technology. Unmanned vehicles that are outfitted with sensors and firefighting gear may enter risky settings and carry out duties that would be too dangerous or complex for human firefighters. These vehicles are called firefighting robotic vehicles. These robotic devices may be operated remotely and are frequently furnished with firefighting tools. The ability of robotic firefighting vehicles to enter dangerous settings without endangering the lives of human firefighters lowers the possibility of injury or death. This is

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one of the key benefits of these vehicles. Robotic systems can also work continuously for extended periods of time without stopping or resting, which is useful in circumstances where time is of the importance. To sum up, robotic firefighting vehicles provide a viable way to improve the security and effectiveness of firefighting operations. These systems are anticipated to grow increasingly complex, adaptable, and efficient in solving the issues encountered by firemen in hazardous areas as robotics technology continues to progress.

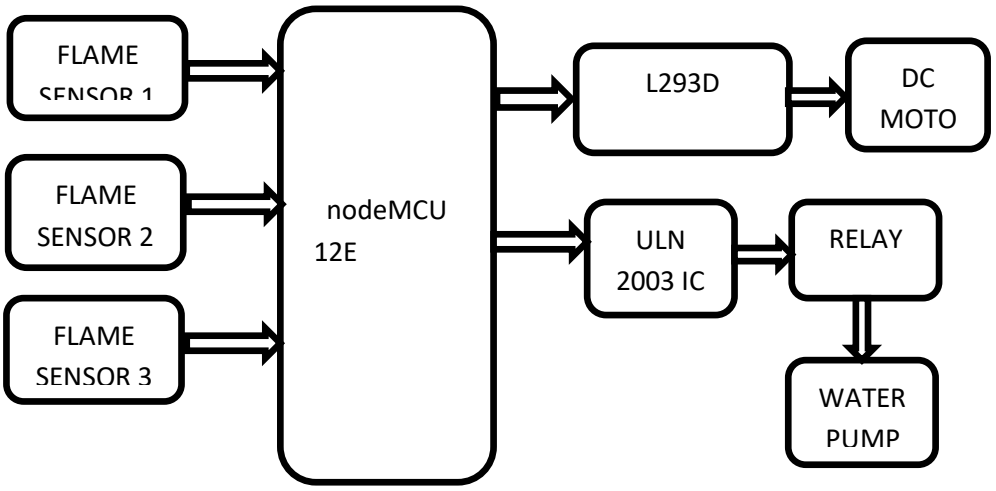

Figure.1 Block diagram

OBJECTIVE OF THE PROJECT

The objective of this project is to mitigate the risks associated with fire incidents by deploying an innovative solution that utilizes robotics and IoT technology to assist firefighters in extinguishing fires. With fire accidents becoming increasingly common, whether caused by human intervention or natural factors, it is imperative to enhance the capabilities of firefighting teams while reducing their exposure to dangerous environments.

Specifically, the project aims to achieve the following objectives:

Develop a robotic system capable of detecting fires autonomously in various environments, including hazardous locations such as nuclear power plants, petroleum refineries, and gas tanks.

Integrate IoT technology, specifically nodeMCU and Blynk server, to enable real-time communication and data updates when a fire is detected. This includes transmitting fire alerts to firefighting teams and controlling the robotic system remotely.

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Implement functionality within the robotic system to navigate and maneuver through small, cramped areas and obstacles commonly encountered during firefighting operations. This includes exploring building ruins and overcoming high barriers to access fire-affected areas.

Enable the robotic system to initiate firefighting measures autonomously upon detecting a fire, including activating a water pump to extinguish the flames effectively.

PROPOSED SYSTEM

This project differs from existing firefighting solutions by combining robotics, IoT technology, and autonomous capabilities to detect and extinguish fires in hazardous environments. Unlike traditional methods reliant on manual intervention, this system operates independently, minimizing risks to firefighters and enhancing efficiency in firefighting operations, especially in inaccessible or dangerous areas

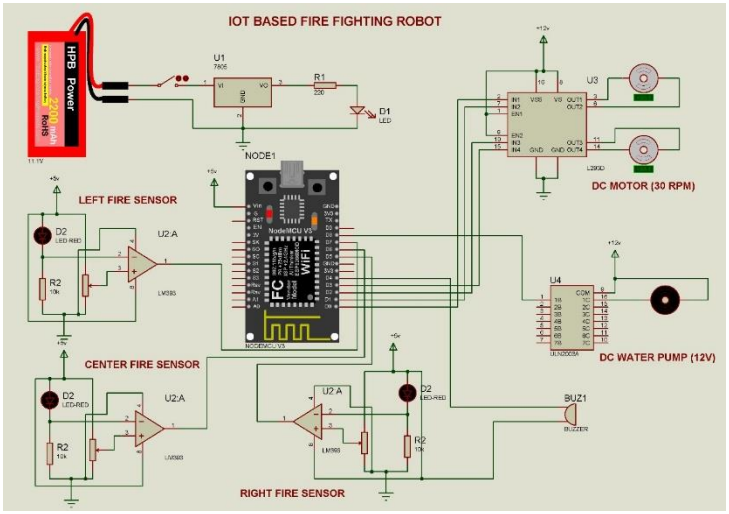

Figure.2 Schematic Diagram

RESULTS

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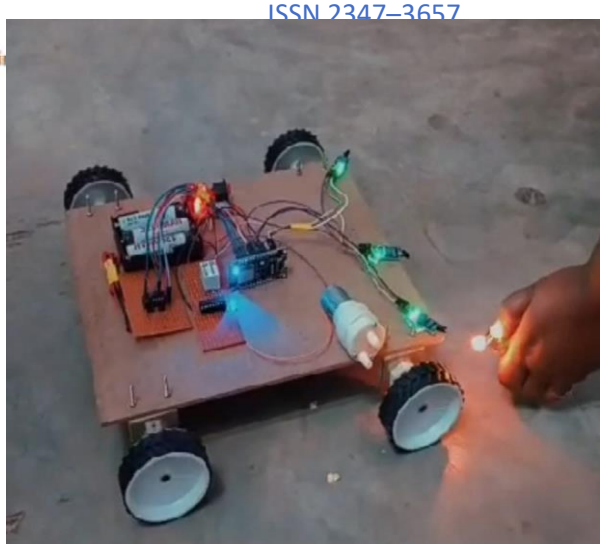

Figure.4 Power supply

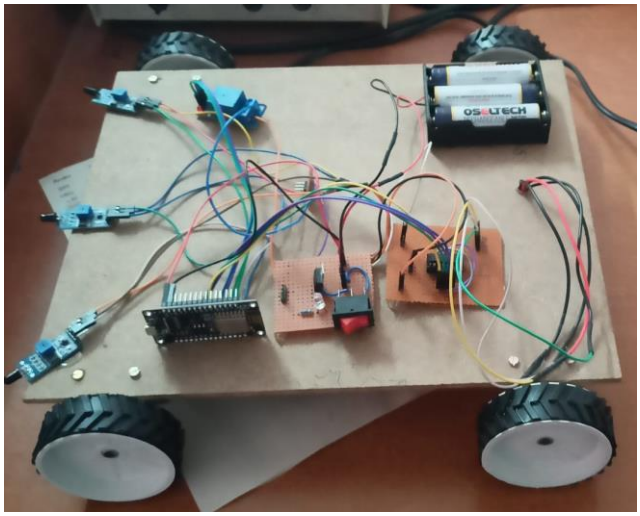

Figure.6 Practical Working

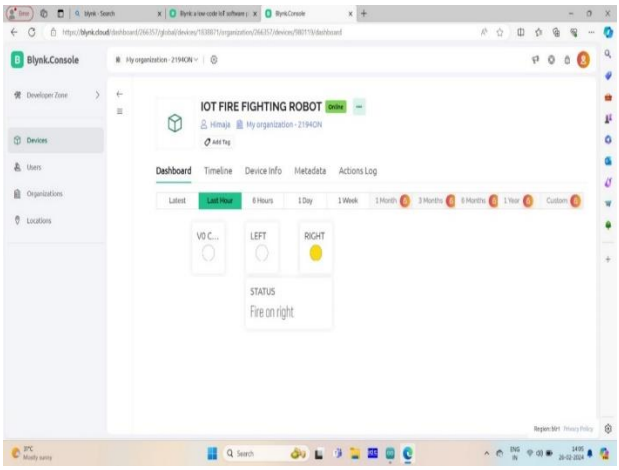

Figure.8 Status Fire on Right

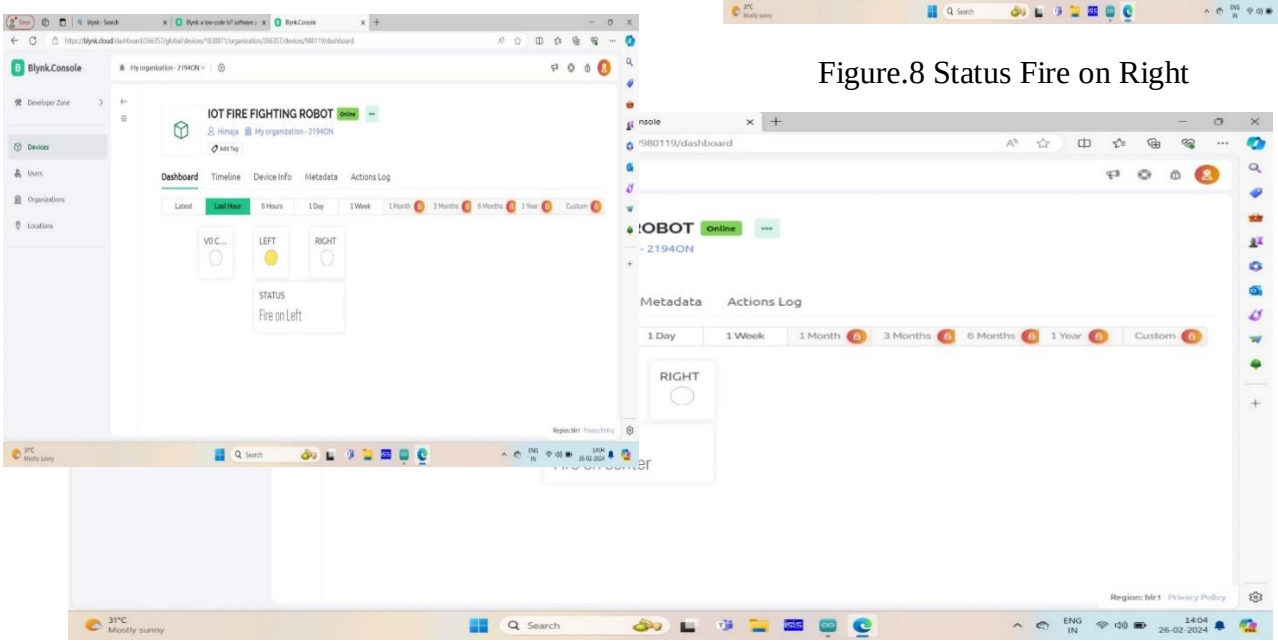

Figure.9 Status Fire on Right

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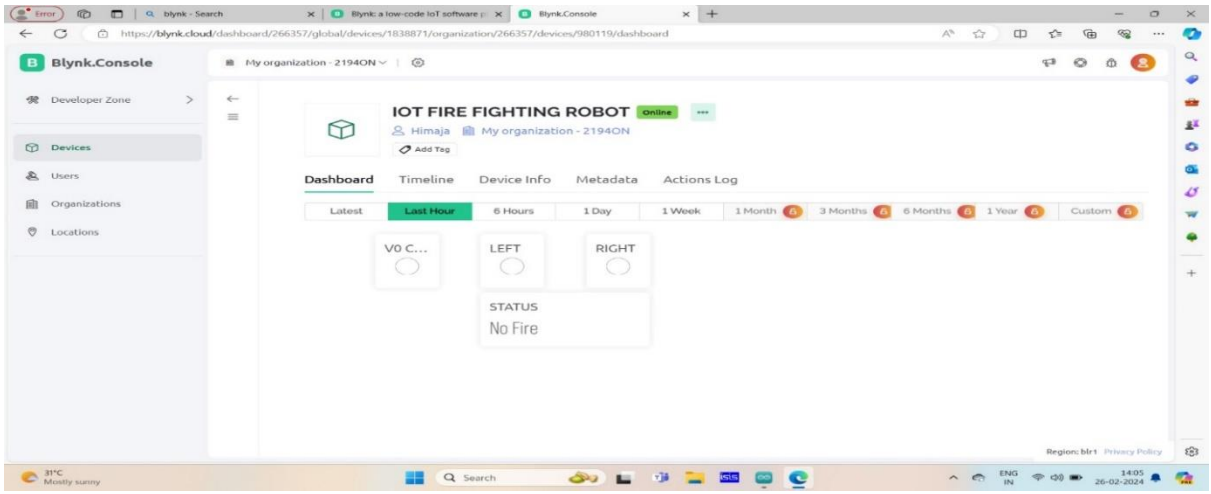

Figure.10 Status No fire

ADVANTAGES

Improved safety for firefighters by reducing their exposure to hazardous environments. Increased efficiency in firefighting operations through timely detection and Intervention, Remote monitoring and control capabilities enhance situational awareness for firefighting Commanders.

CONCLUSION

In conclusion, the development of our firefighting vehicle incorporating advanced technologies such as the node MCU, flame sensor, DC water pump, and integration with the Blynk server represents a significant leap forward in firefighting capabilities. By harnessing the power of IoT and real-time data transmission, our vehicle offers enhanced responsiveness and efficiency in combating fires.

The node MCU enables seamless connectivity and control, allowing for remote monitoring and operation of the vehicle's functions. The inclusion of a flame sensor enhances safety by providing early detection of fires, enabling prompt intervention to mitigate risks effectively.

Furthermore, the integration of a DC water pump ensures reliable water supply for firefighting efforts, while the ability to upload data to the Blynk server facilitates comprehensive data analysis and optimization of firefighting strategies.

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In essence, our firefighting vehicle stands at the forefront of innovation, poised to revolutionize firefighting operations by leveraging cutting-edge technology to safeguard lives and property. As we continue to refine and enhance its capabilities, we are committed to delivering a safer and more resilient future for communities worldwide.

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