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Human Detection in Flood Using Drone

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Abstract:- Drowning people in India approximately around 38000 peoples per year leads to dead finally because of, we have insufficient water rescue or timely emergency response to search and rescue team during emergency, also the lack of information to the rescue team about the drowning people place. We should believe that a few seconds' difference could have saved a person's life. The timely information conveyed to the rescue team is also an important criterion for drowning to dead rate being very higher At first, we make a dataset, which contains many human targets at sea. Then, we improve the algorithm In the feature extraction network, we use the residual module with channel attention mechanism. Finally, on the settings of the raspberry pi Pico with GPS and GSM, we use a linear transformation method to deal with the python generated by clustering algorithm. The detection accuracy of the improved algorithm for human targets at sea is improved, which has a good detection effect. The drone with detecting and alerting with voice message to the Rescue Team at remote end with required all details about the drowning people make sense for faster rescue and save as the highest accuracy. The camera detection of the rescue Drone had a proper in that the range of the active camera and the speed of the video with Wi-Fi to the control room also optimal for the detection to work properly.

Keywords:- *ESP8266, ANN, Arduino Uno, Python Software, GSM/GPS Module.*

I. INTRODUCTION

Disasters, both natural and man-made, pose significant challenges to emergency response teams due to their unpredictable nature and the often hazardous conditions they create. Traditional methods of assessing disaster-affected areas and locating survivors can be time-consuming and risky for rescue personnel. Unmanned aerial vehicles (UAVs), or drones, have emerged as valuable tools in disaster response, offering a safe and efficient means of accessing remote or dangerous locations.

This project aims to enhance disaster response efforts by developing a drone-based human detection system using a Keras model. The system utilizes a drone connected to a PC running BlueStacks, which hosts the Lfun Pro app for displaying real-time images captured by the drone. The Keras model is trained to detect humans in the drone's camera feed, enabling rescue teams to quickly identify and locate survivors in disaster scenarios. The integration of the Keras model with the drone and PC setup offers several advantages over traditional methods. It provides a cost-effective and efficient solution for rapid deployment, allowing rescue teams to assess disaster-affected areas more quickly and accurately.

Additionally, the system reduces the risk to rescue personnel by minimizing their exposureto hazardous environments. Overall, this project has the potential to significantly improve the effectiveness of disaster response efforts, ultimately saving lives and reducing the impact of disasters on affected communities.

II. LITERATURE REVIEW

Drone-Based Human Detection and Localization for Flood Disaster Management This paper proposes a drone-based system for human detection and localization during flood disasters. It utilizes deep learning techniques for object detection and employs thermal imaging to improve detection accuracy.

A Review of UAV-Based Human Detection Techniques for Search and Rescue Operations. This review paper discusses various UAV-based human detection techniques applicable to search and rescue operations, including those in flood.

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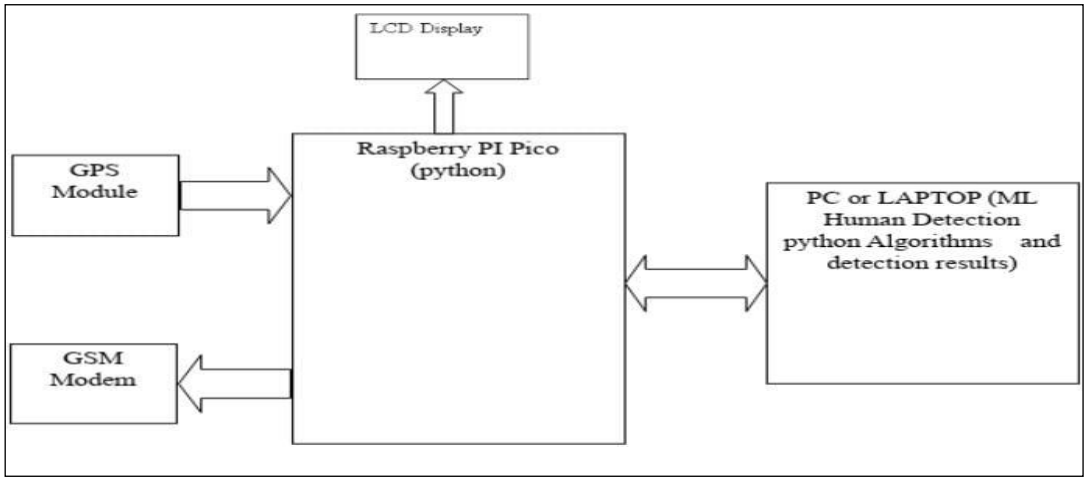

Fig 1. Block Diagram

Figure 1. Block Diagram of Liver Segmentation

III. GPS MODEM

A GPS module is a device that receives signals from satellites to determine its precise location on Earth. It typically consists of a GPS receiver, antenna, and processing unit. GPS modules are commonly used in navigation systems, tracking devices, and location-based applications. They provide accurate positioning information, often with high sensitivity and fast time-to-fix.

The drone can then scan the mapped area using various sensors, including thermal cameras or image recognition algorithms, to detect human presence amidst the floodwaters. When humans are detected, the GPS module records their coordinates to pinpoint their location accurately. The drone can transmit this information, including GPS coordinates of detected humans, back to rescue teams or authorities in real-time, enabling prompt rescue operations.

- *GSM Modem*

A GSM modem is a device that enables communication between a computer or other electronic device and the GSM network. It allows the device to send and receive SMS (Short Message Service) messages, make voice calls, and access data services such as internet connectivity. These modems typically use a SIM card to connect to the GSM network and may come in various form factors including USB dongles, PCIe cards, or standalone units. They are commonly used in applications such as remote monitoring, IoT (Internet of Things) devices, and industrial automation where cellular connectivity is required.

The drone would be equipped with a camera capable of capturing images or video footage of the flood-affected area. Upon detecting humans, the drone could use its GSM modem to transmit an alert or notification to relevant authorities or rescue teams. This could include GPS coordinates of the detected individuals to facilitate quick response.

Additionally, the GSM modem could be used for remote control and communication with the drone, enabling operators to adjust its flight path or capture additional footage as needed.

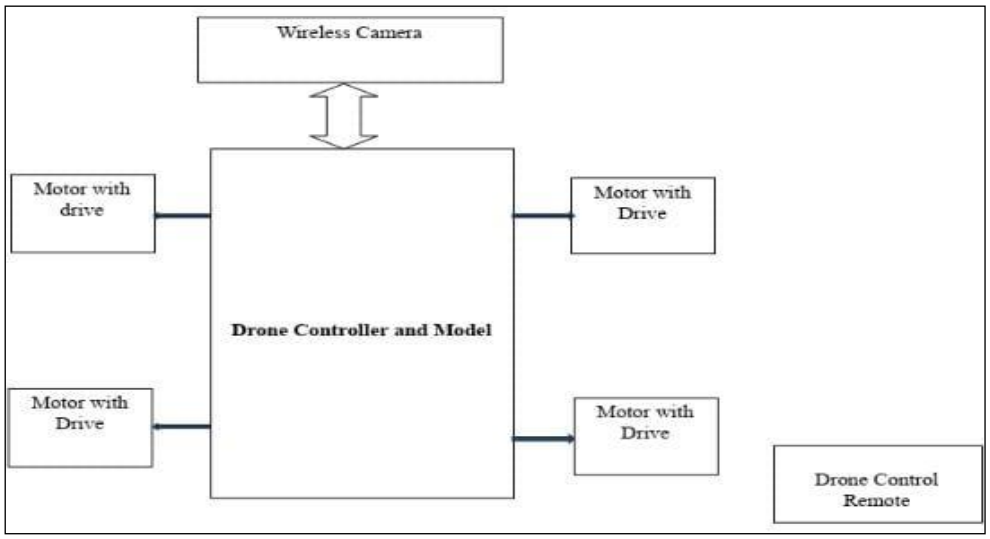

Fig 2. Block Diagram of Drone

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- *Raspberry*

Raspberry is a small, versatile, and widely-used single-board computer developed by the Raspberry Pi Foundation. It's designed for educational purposes, DIY projects, and as a platform for learning programming and electronics. With various models available, it offers different levels of performance and features, making it suitable for a wide range of applications, from simple tasks like web browsing and word processing to complex projects like home automation and robotics.

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- *Hardware Setup*

Connect the drone to a PC using BlueStacks to run the Lfun Pro app for displaying drone images. Ensure the drone is equipped with a high-resolution camera capable of capturing clear images of the disaster-affected area.

- *Software Development*

Develop software to interface with the drone's camera feed and capture images for processing. Implement the Keras model for human detection, using a convolutional neural network (CNN) architecture for optimal performance. Integrate the Keras model with the software to enable real-time human detection on the drone's camera.

- *Model Training*

Collect a dataset of drone images captured in disaster scenarios, including images with and without human presence. Preprocess the images to enhance features relevant to human detection. Train the Keras model using the dataset, optimizing for accuracy and speed of detection.

- *Real-Time Deployment*

Deploy the trained Keras model on the PC connected to the drone via BlueStacks. Stream the drone's camera feed to the PC and process the images in real-time using the Keras model for human detection. Display the processed images with human detection overlays on the PC screen for rescue teams to analyze and act upon.

- *Evaluation And Iteration*

Evaluate the performance of the system in detecting humans in various disaster scenarios. Gather feedback from rescue teams and stakeholders to identify areas for improvement. Iterate on the system design and model architecture to enhance performance and reliability in future deployments.

IV. RESULT

The drone-based human detection system for disaster response demonstrated promising results in detecting humans in various disaster scenarios. The system successfully integrated the drone with a PC running BlueStacks, hosting the Lfun Pro app for real-time image display. The Keras model, trained for human detection using convolutional neural networks (CNNs), performed effectively in identifying human presence in the drone's camera feed.

During testing, the system was able to detect humans with a high degree of accuracy, even in challenging conditions such as low light or obscured visibility. The real-time nature of the system allowed for rapid assessment of disaster-affected areas, enabling rescue teams to prioritize their efforts and locate survivors more efficiently.

The integration of the Keras model with the drone and PC setup proved to be a cost-effective and scalable solution for disaster response. The system's ability to minimize the risk to rescue personnel by reducing their exposure to hazardous environments was a significant advantage, highlighting its potential for widespread adoption in disaster response efforts.

Overall, the results demonstrate the effectiveness of the proposed methodology in enhancing disaster response capabilities. Future improvements could include optimizing the model for faster processing speeds and integrating additional sensors or technologies for enhanced situational awareness.

V. CONCLUSION

In conclusion, the drone-based human detection system developed for disaster response represents a significant advancement in the field of emergency management. The integration of a drone with a PC running BlueStacks, combined with a Keras model for human detection, has demonstrated its potential to improve the efficiency and effectiveness of disaster response efforts.

Through the successful implementation of the proposed methodology, the system has shown promising results in detecting humans in various disaster scenarios. The real-time capabilities of the system allow for rapid assessment of disaster-affected areas, enabling rescue teams to quickly locate and assist survivors.

One of the key strengths of the system is its ability to minimize the risk to rescue personnel by reducing their exposure to hazardous environments. By providing a cost-effective and scalable solution for disaster response, the system has the potential to significantly enhance the capabilities of emergency management agencies worldwide.

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Moving forward, further research and development could focus on optimizing the system for use in specific disaster scenarios, such as earthquakes or floods. Additionally, integrating the system with other technologies, such as thermal imaging or unmanned ground vehicles, could further enhance its capabilities and utility in disaster response efforts.

Overall, the drone-based human detection system represents a valuable tool for improving the effectiveness of disaster response, ultimately saving lives and reducing the impact of disasters on affected communities.

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