

# Rescue Based Unmanned Aerial Vehicle Using Deep Learning Algorithm

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**ABSTRACT:**In the past decade, numerous new and spectacular applications are developed and enforced on UAVs, for search and rescue, traffic observance, weather observance, etc. The advancement in drone technology creates vital changes in facultative drones to perform the missions with increasing level of complexities such as search and rescue which require a large camera coverage to perform advanced tasks. Meanwhile, the increasing trend of deep learning applications in computer vision provides a remarkable insight into the initiative of this system. This paper presents a technique which allows detecting the existence of human in affected regions with human object detection algorithm using deep learning framework in raspberry pi3. The location of the person is also known by using gpsembedded with drone. The system are more useful for surveillance in some places where humans are not capable to monitor. This system can also be used in military areas to track the trespassers.

**KEYWORDS:**Deep Learning, Raspberry pi3, UAV

## I. INTRODUCTION

In the times of natural calamities, the rescue team finds difficult to monitor people at risk. UAVs were originally used for missions too "dirty or dangerous" for humans. Whereas they originated largely in military applications, their use is apace increasing in industrial, scientific, recreational, agricultural, and different applications, like policing, peacekeeping, surveillance, product deliveries, aerial photography, agriculture, smuggling, and drone athletics. The paper deals with Deep Learning which may be a quick growing domain of Machine Learning and within the field of computer vision/image processing already (or obtaining up to speed), it's an important space to explore. With OpenCV, we will utilize pre-trained networks with widespread deep learning frameworks. Open CV (Open source computer Vision Library) is an open source computer vision and machine learning software system library. OpenCV was designed to supply a typical infrastructure for computer vision applications and to accelerate the employment of machine perception within the industrial merchandise. The library has over 2500 optimized algorithms, which incorporates a comprehensive set of each classic and progressive laptop vision and machine learning algorithms. These algorithms is accustomed sight and acknowledge faces, determine objects, classify human actions in videos, track camera movements, track moving objects, extract 3D models of objects, turn out 3D purpose clouds from stereo cameras, sew pictures along to supply a high resolution image of a whole scene, realize similar pictures from a picture info, take away red eyes from pictures taken using flash, follow eye movements, acknowledge scenery and establish markers to overlay it with increased reality, etc.

## II. RELATED WORK

The Aerial artificial intelligence, as well as unmanned aerial vehicles (UAVs), aka drones, show tremendous potential to remodel humanitarian aid. In this technology, team will map tract more effectively, assess injury in real time, increase situational awareness through high-resolution mapping and deliver things quicker, cheaper and more efficiently. Lower in price, lighter in weight (as very little as 3 pounds) and quieter

than helicopters or planes, with pre-programmed routes that alter them to fly in serious conditions, these “digital responders” give access to otherwise inaccessible areas. Additionally, infrared cameras and advanced listening systems enable UAVs to uncover survivors from rubble or among flames and increasing the success of important rescue efforts. Even nowadays drone is used in function halls for events.

Mohan Ramesh briefly explained about the era of drones in India and its future scope. In his paper, the history of drones were discussed clearly and its development in India for domestic and industrial purposes [1]. V. Mustafa explained about how the image processing works in his counter system. In his paper, the real time people detection was carried for counter purpose which is practically can be used in office, colleges, and so on [2].

### III. PROPOSED SYSTEM

The proposed system deals with human detection using pi camera interfaced with Raspberry pi. The UAV helps in flying or moving around places where humans are unable to move on. The human detection is done using a software known as Open CV. The human detection system includes deep learning algorithm. The specific identification between human and other objects increases the efficiency of the system. The reinforcement finds easy in locating people. When we detect a human, using gps modulo the location of the drone can be located. The overall image processing system is fixed on the drone as shown in fig[1].

### IV. SYSTEM BLOCK

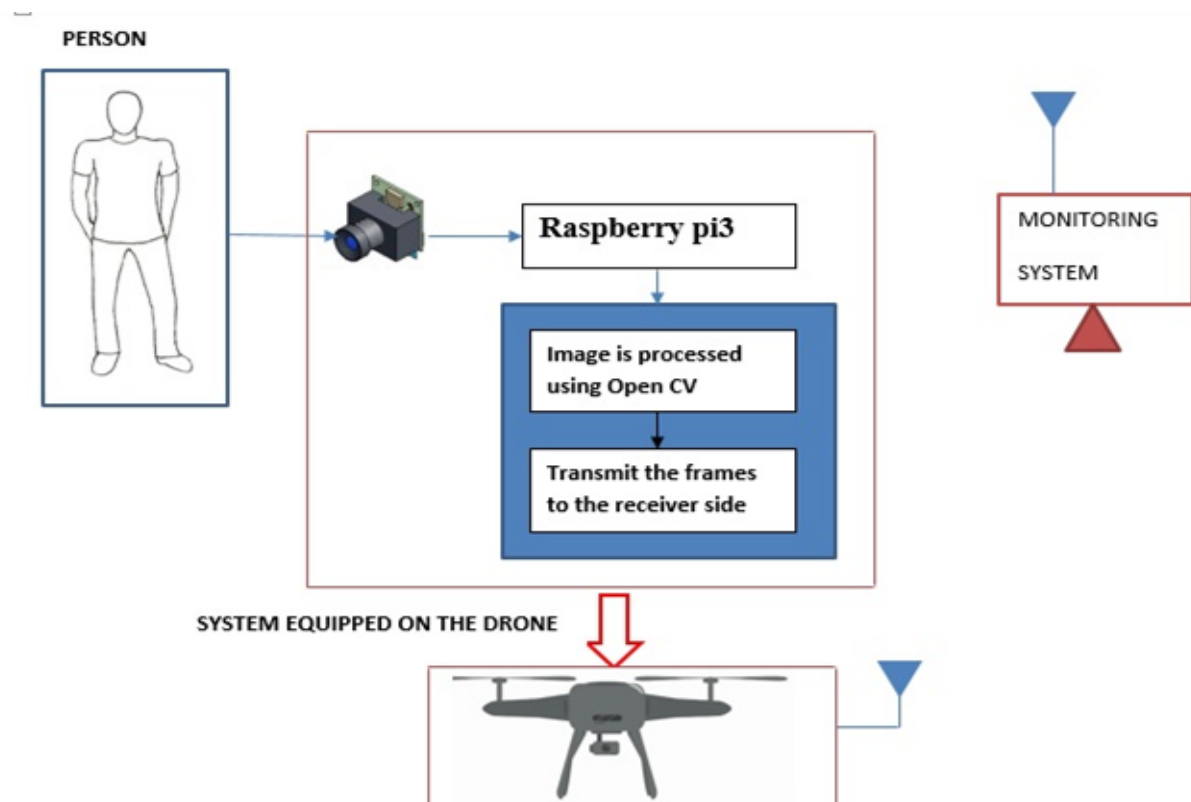
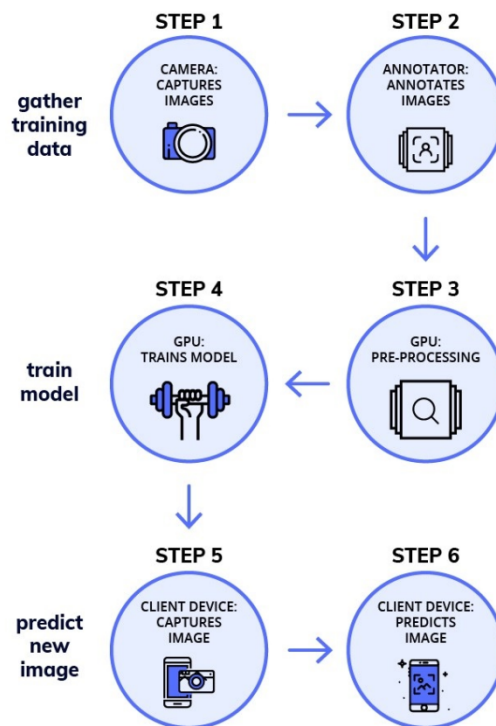


Fig 1 Proposed System

### V. WORKING PRINCIPLE

The human detection works based on the image processing technique as shown in fig [2]. In step 1, there is a need of few 100 Images per Object. Try to capture data as close as possible to make predictions on. In step 2, draw bounding boxes on the images using a tool like labeling. In step 3, a pre-trained model is needed to reduce the amount of data required to train. Without it, there will be difficult for a few 100k images to train the model. In the next step, the Docker image is created because the process of training a model is unnecessarily difficult to simplify it, the Docker image would make it easy to train. Small devices like Mobile Phones and Raspberry Pi have very little memory and computation power.

Training neural networks are done by applying many tiny nudges to the weights, and these small increments typically need floating point precision to work (though there are research efforts to use quantized representations here too). Taking a pre-trained model and running inference is very different. In the final step, the new image is obtained by using Pi camera and predicting a new image.



*Fig 2 Image Processing Technique*

The entire setup will be installed in a remote control enabled UAV for long range surveillance in disaster areas. The video sensing between the camera and monitoring system will be enabled by the use of already developed team viewer software. The team viewer software is used for remote access of one system from another system.

### VI. EXPERIMENTAL RESULTS

The fig[3] shows the output of the proposed system. The human detection camera will detect the human in the diseased areas and annotates the captured image. The annotated image will also shows the percentage

