PROJECT DETAILS

## <u>**SEARCH AND RESCUE DRONE**</u>

We have designed a more efficient system to assist humans in these extreme conditions.

I.   Process Flow Chart

## 1) Computer Vision Implementation Flow Chart

We use a pre-existing RetinaNet model to finetuned the model to detect humans, through the camera. So this model is being trained on ten thousand images of humans in similar extreme conditions. In conclusion, this model is unique because it has Focal Loss and an FPN network to increase the detection accuracy over smaller objects.
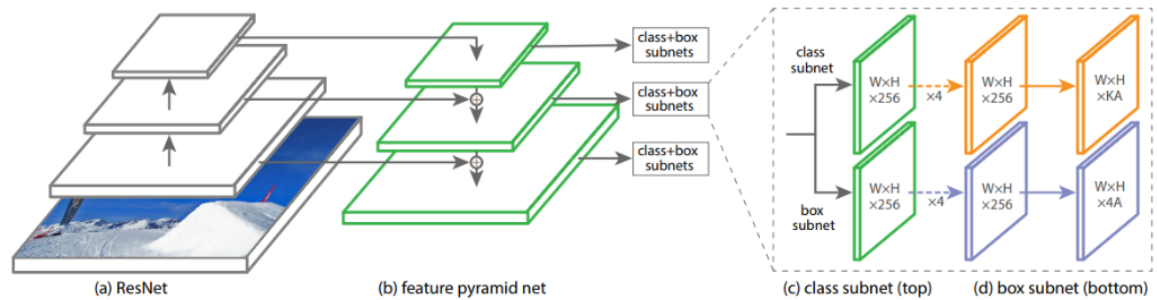
Img_src: http://arxiv.org/abs/1708.02002 arXiv:1708.02002

2) Quadcopter Design Method

The model is designed and simulated in Solidworks and the shown process is followed.
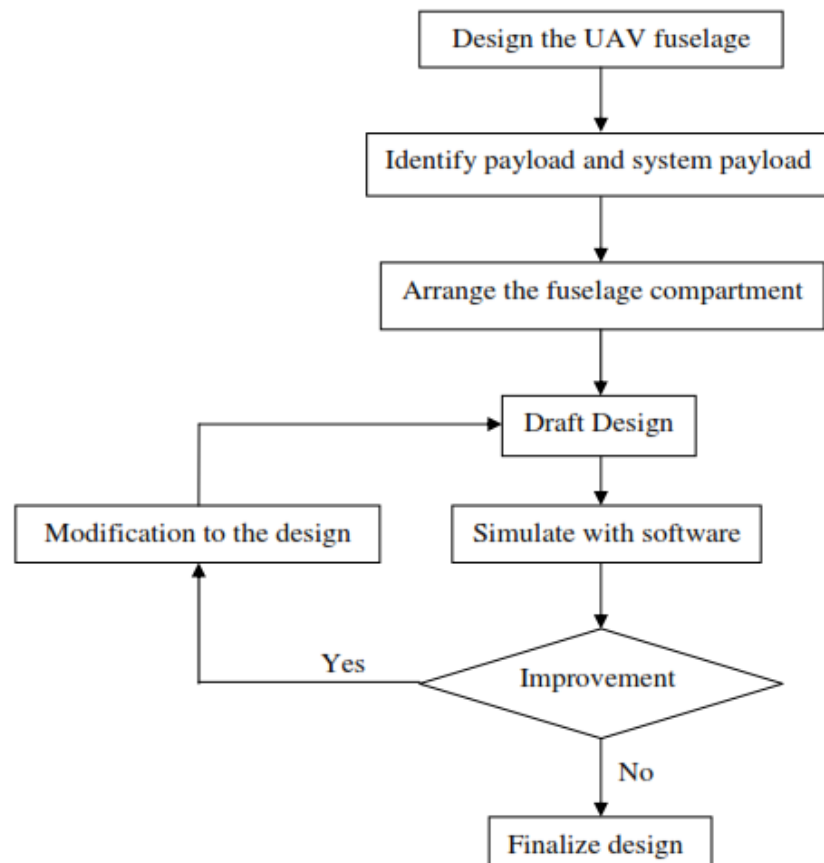
II. Technology Involved

1. The Deep Learning model used is RetinaNet, it's the Computer vision deep learning method that detects the human being and shows the position in the image by making a rectangular box around the detected human beings in the interface.

2. Drone Hardware:

   i) KK2.1.5 Flight Controller is being used to stabilize and control the quadcopter system.
   ii) BLDC motor of 1800kV is being used whilst considering torque and lift for the chosen frame size paired with 30A ESC.
   iii) Carbon fiber frame of size 250mm is being used.
   iv) The whole system is powered by a LiPo battery, 3200mAh – 11.1V.
   v) FPV Camera of Resolution 700 TVL with Telemetry kit.

III. Scope & Importance

This is an attempt to better understand control systems, and deep learning via computer vision, microcontrollers, and flight-oriented machines (Aeronautics).

Quadcopter is used to suspend the camera at a height to aerially scan the landscape and do the needful. The positions of the object, inclusive of GPS location will be sent back to the control user.

The future scope for the project involves automatized flight, automatic detection, load lifting capabilities (including human beings), and a much more efficient aerial landscaping algorithm.