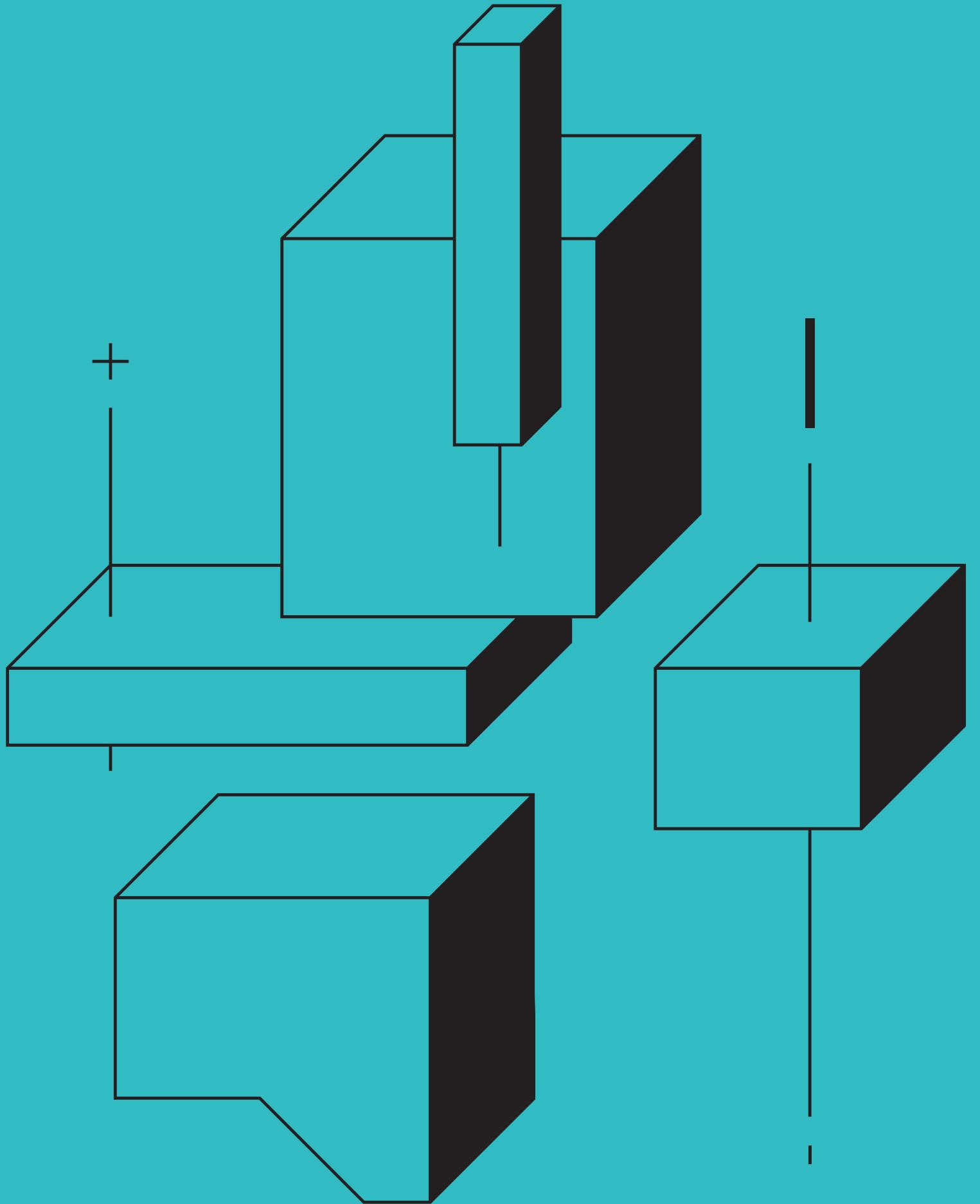


# Autonomous Drone for military surveillance

CSE1901

Simrat Singh 19BAI1084  
Vaibhav Gadag 19BAI1036



# Abstract



We are building an autonomous drone which runs an object detection algorithm on the video input which it gets through the camera module (pi cam or a mobile phone). The object detection algorithm classifies people and maintains a counter of the number of people detected and assigns every individual person an id number so the person isn't counted twice. We will live stream the drone's video footage to the client-side app. We program the drone to follow a fixed route based on the locale by setting coordinates and checkpoints.

# Introduction

The system proposed by us includes the video feed being transferred in real-time from IoT devices that act as a middleman (in our case raspberry pi or a mobile phone) between the local pc and the camera. We are sending the feed to the local pc as we require high computational power for the processing, whereas we can use a microprocessor like a Nvidea jetson but due to budget constraints we are using the local pc itself. The video feed sent to the local pc is processed by the pre-trained models and then detected if there is a human detected or not. The architecture used for training the model is FasterRCNN. We implemented this on our local pc as we sent the video feed via IP communication.

# Parts of our project

Below are the three diff parts of our project which when integrated together result in the final product.



Autonomous flight



Feed transfer from drone to local pc



Implementing the ML model

# Components used

Name	Model	Weight(grams)
GPS module	Ublox NEO M8N	33
Pixhawk power module	APM/Pixhawk Power Module V6.0	24
ESC	Emax BLHeli Series 30A ESC	28*6
LiPo battery	ORANGE 4200/3S	319
Propellers	Orange HD Propellers 1047(10X4.7)	22*3=66
Drone frame	F550 hexacopter frame	620
Pixhawk	Pixhawk 2.4.8	15
Telemetry	3DR Radio Telemetry	33
Pi Camera	Pi Cam V2	3
BLDC Motor	EMAX xa2212 980kV	55*6=330
Raspberry pi	Model 3b+	50

# Time of Flight

Time of Flight (in minutes) = (Battery capacity \* 60) / (Current draw)

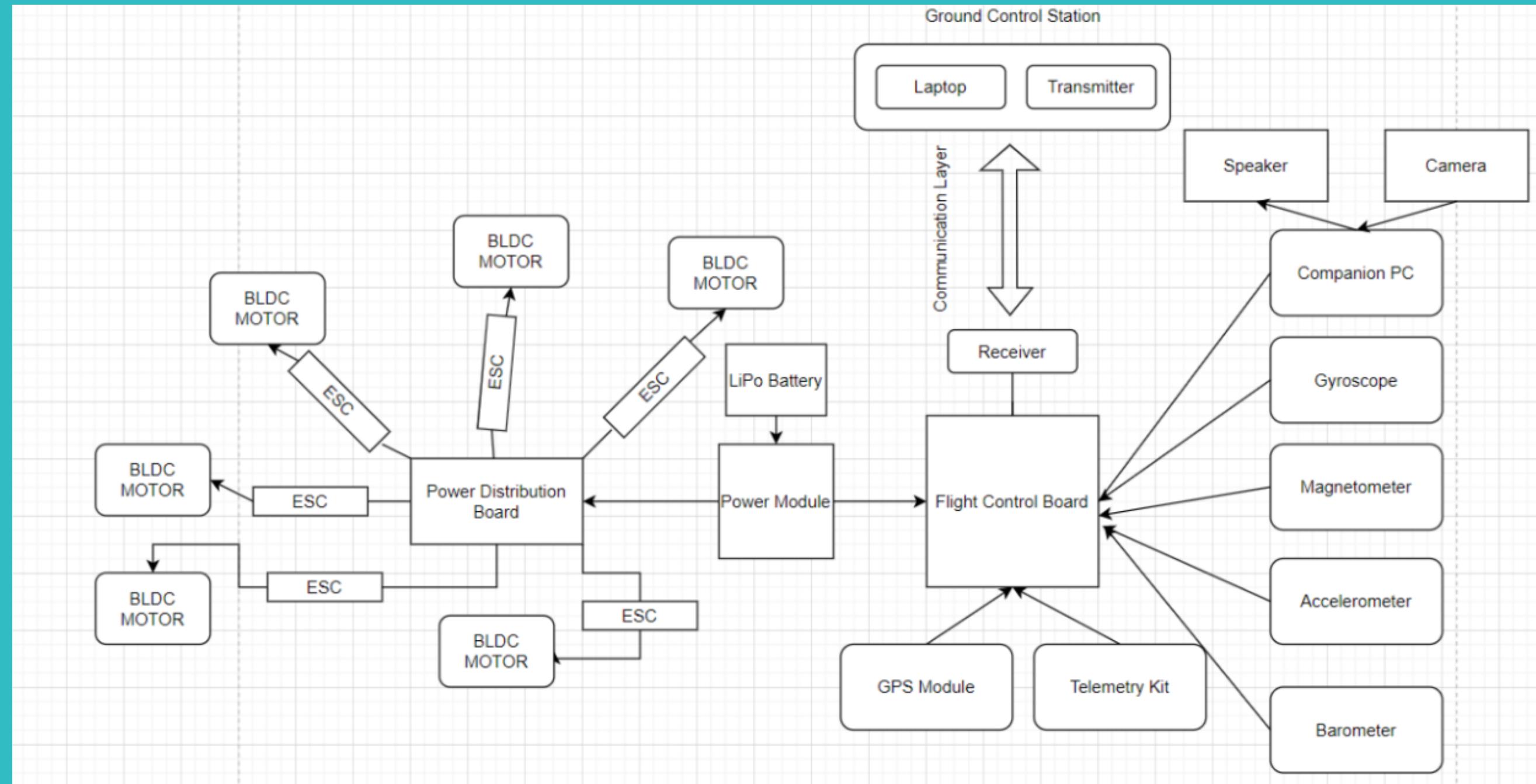
Time of Flight =  $(4200 * 0.001 * 60) / 57.6 = 4.375$  minutes.

# Area Covered

The drone moves at a speed of 7m/s

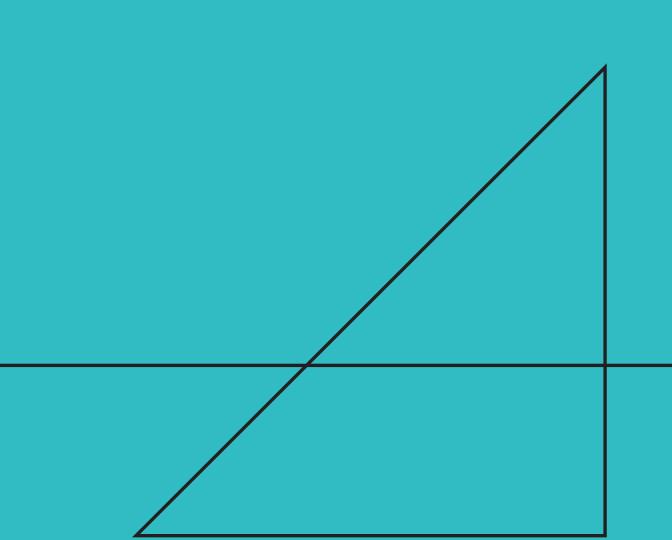
On the basis of that speed drone will be able to cover a path of 1837.5 meters

# Architecture diagram

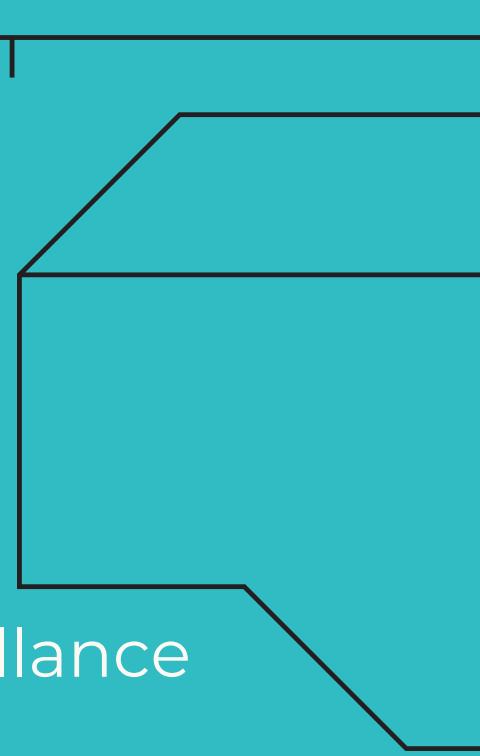


# Final Output





# Some papers referenced



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# Thank You

Project under Dr. Radha R