Autonomous Aerial Assistance for Search and Rescue

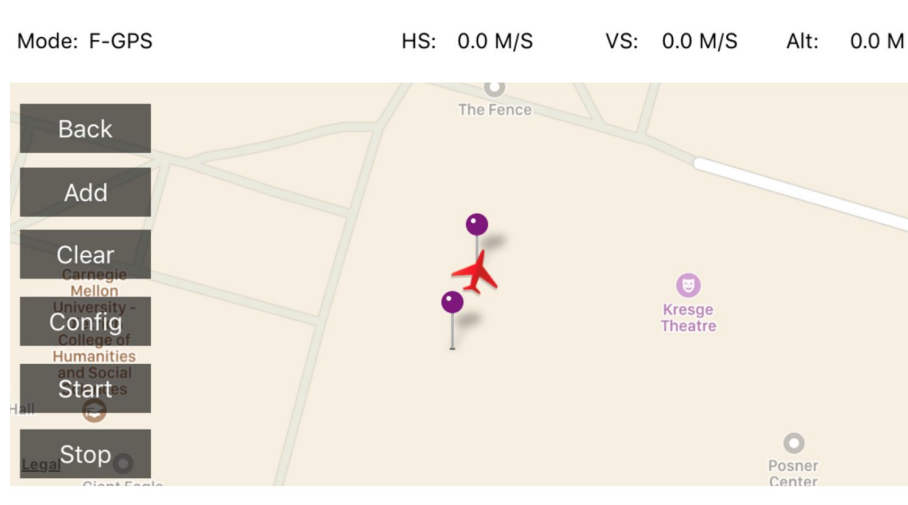**Team F**

Project Review 4
November, 22, 2016

Tasks

1. Waypoint Navigation test
2. Waypoint navigation
3. Camera on the drone
4. Package Drop Mechanism
5. RGB based Human Signature Detection
6. Risks

Waypoint Navigation test

[Waypoint Navigation test](#)

Waypoint Navigation

- Working on changes to the waypoint navigation app for giving providing precise GPS location as input (in addition to map)
- Working on changes to detect altitude and location of the drone using RGB camera and image.
- Also exploring AprilTags

Camera on the drone

To enable us:

- to estimate the drone's altitude
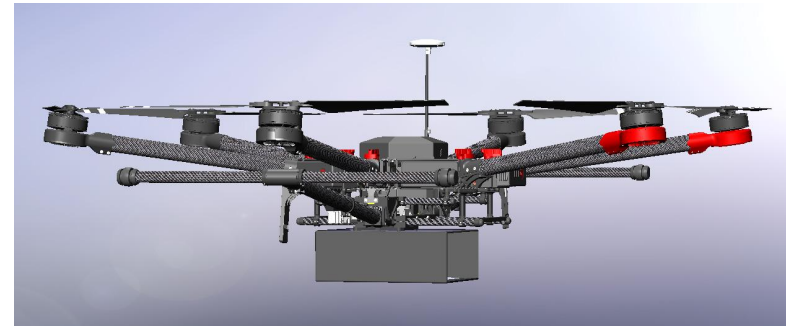- to measure accuracy in reaching waypoints
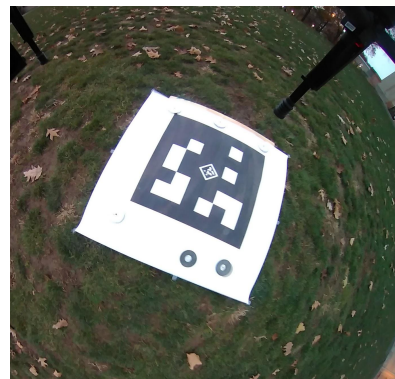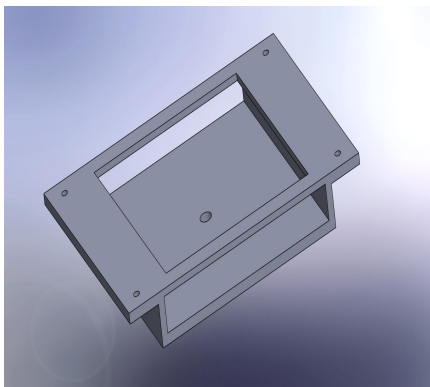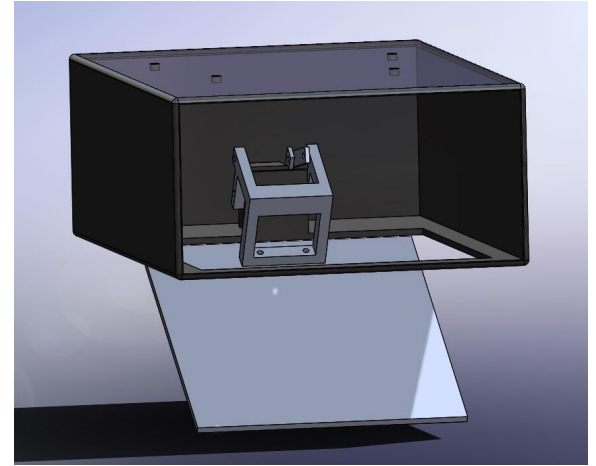
Package Drop Mechanism

Requirements:

The mechanism should:

- carry a 10cm x 10cm, 100g package
- carry the package reliably during flight
- safely release the package, when required

First pass:

- Simple design with single servo actuation

Package Drop Mechanism

Pros:

- Ease of loading
- Good grip of the package throughout the flight

Cons:

- Time to manufacture
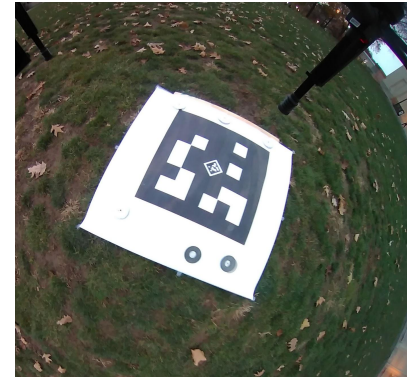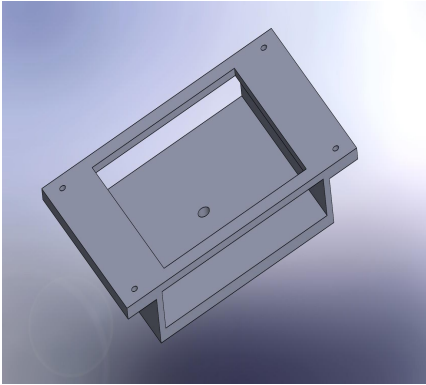- Dependency on servo motor's torque

May be design:

Camera on the drone

To enable us:

- to estimate the drone's altitude
- to measure accuracy in reaching waypoints

RGB based Human Signature Detection

**Create suitable training set for the classification**
- Positive set: Lucas-Kanade tracking method
- Negative set: Randomly selected background images

Strategies to find human candidates
- Background Subtraction(if human is moving)
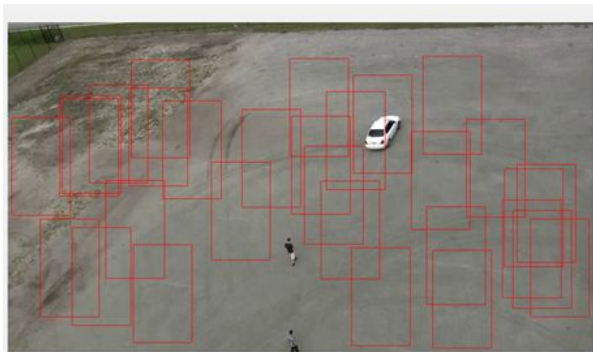- Blob detection + edge detection(if human is stationary)

Create suitable training set for the classification

Lucas-Kanade tracking method
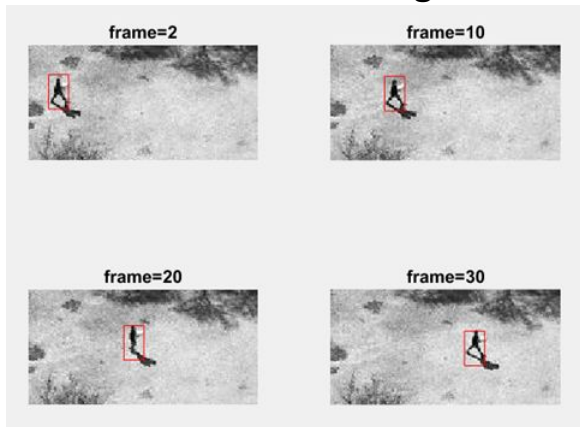
Positive set: around 300 images

Randomly selected background images

Negative set: around 800 images

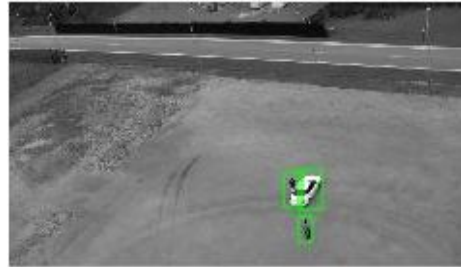# Find Potential Human Candidates—Background Subtraction
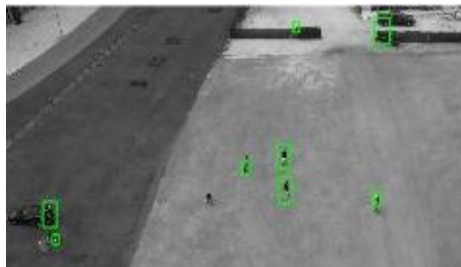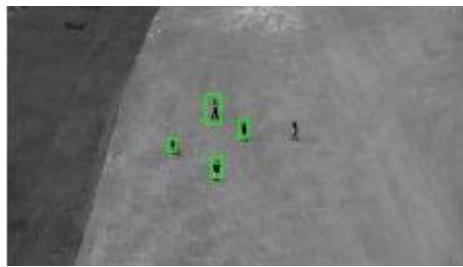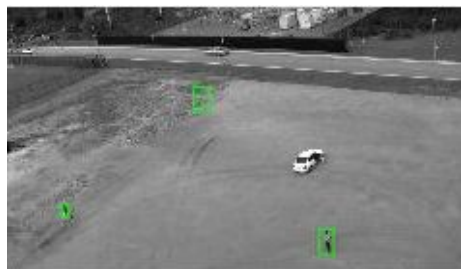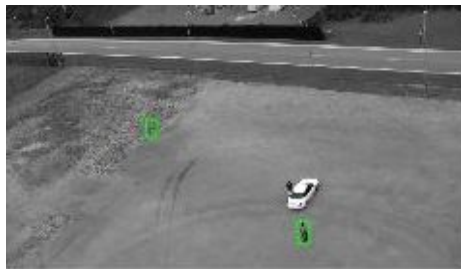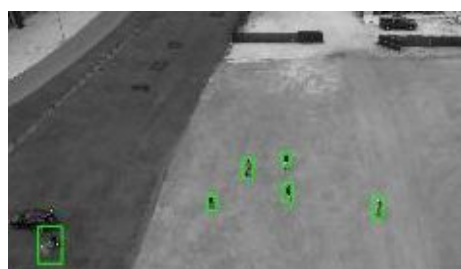
Basic idea:

- ViBe

Features:

- Efficiently capture the outline of moving object (potential human beings)
- Not Robust enough when the background is not static

Find Potential Human Candidates—Edge + Blob

Risks

- Weather conditions

Thanks!