



# UAV FORGE-EECS

Che-Wei Chang, Junbai Hou

Professor Ian Harris

Department of Electrical Engineering and Computer Science

Department of Computer Science

## Introduction

This project aims to build a fixed-wing UAV that could autonomously complete a series of flight missions including obstacle avoidance, image capture and recognition, and payload dropping. The project will compete in the 2019 AUVSI SUAS competition.

## Design Approach

- Design a fully autonomous UAV that can takeoff, cruise, and land.
- Design an ground client that provides data link to the remote server hosted by the competition.
- Design an onboard camera system that can take surveillance picture, geotagging, and stream it to our ground control station.
- Design computer vision module to process image and identify target object.
- Be able to release a payload while in flight and achieve high accuracy.

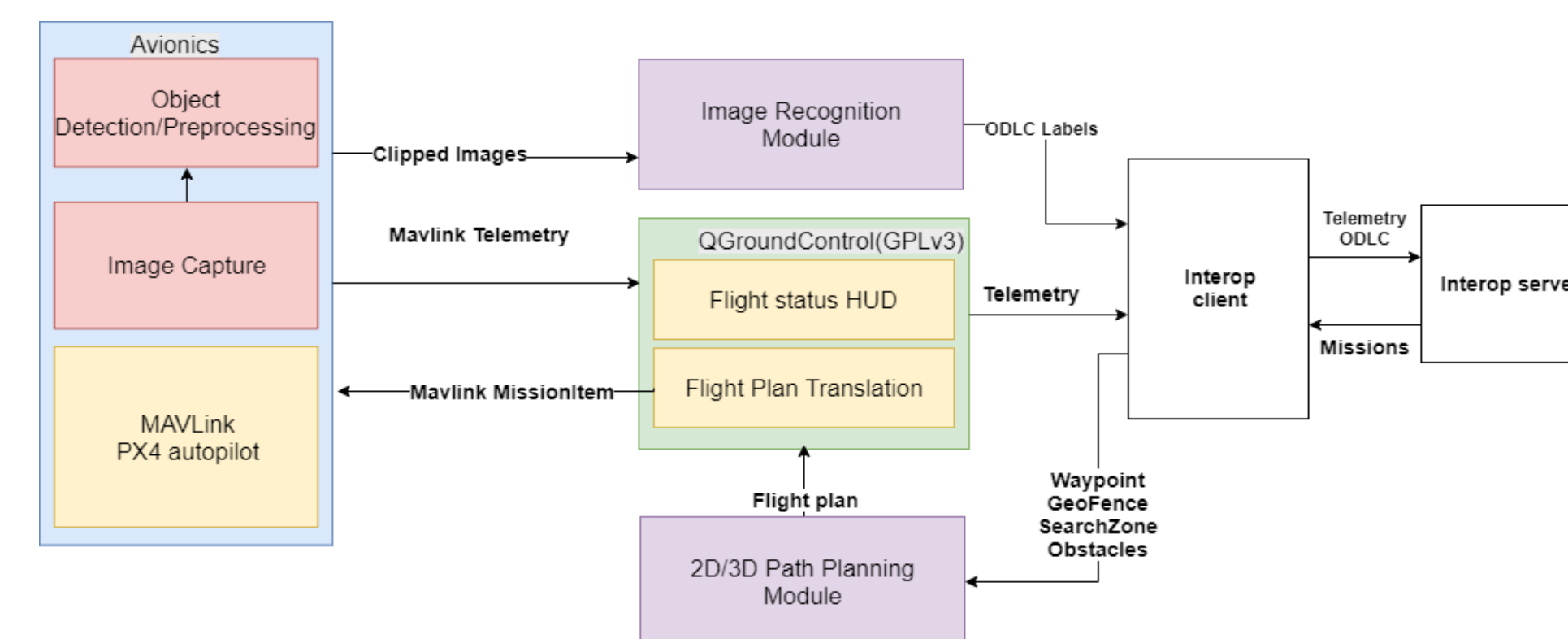
## Current Progress

### Software:

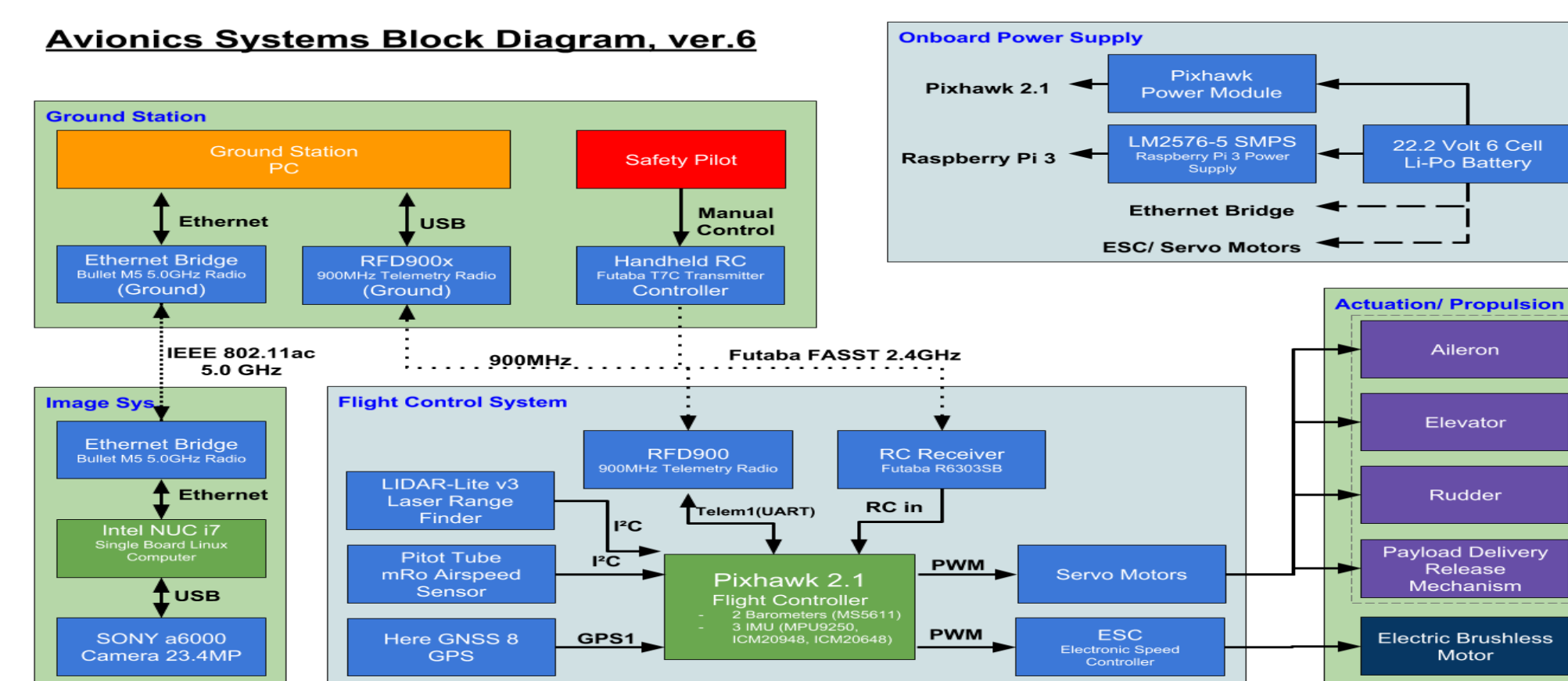
- Server-client-autopilot downstream traffic
- Aircraft landing waypoint sequence interpolation
- Open source software integration.

### Hardware:

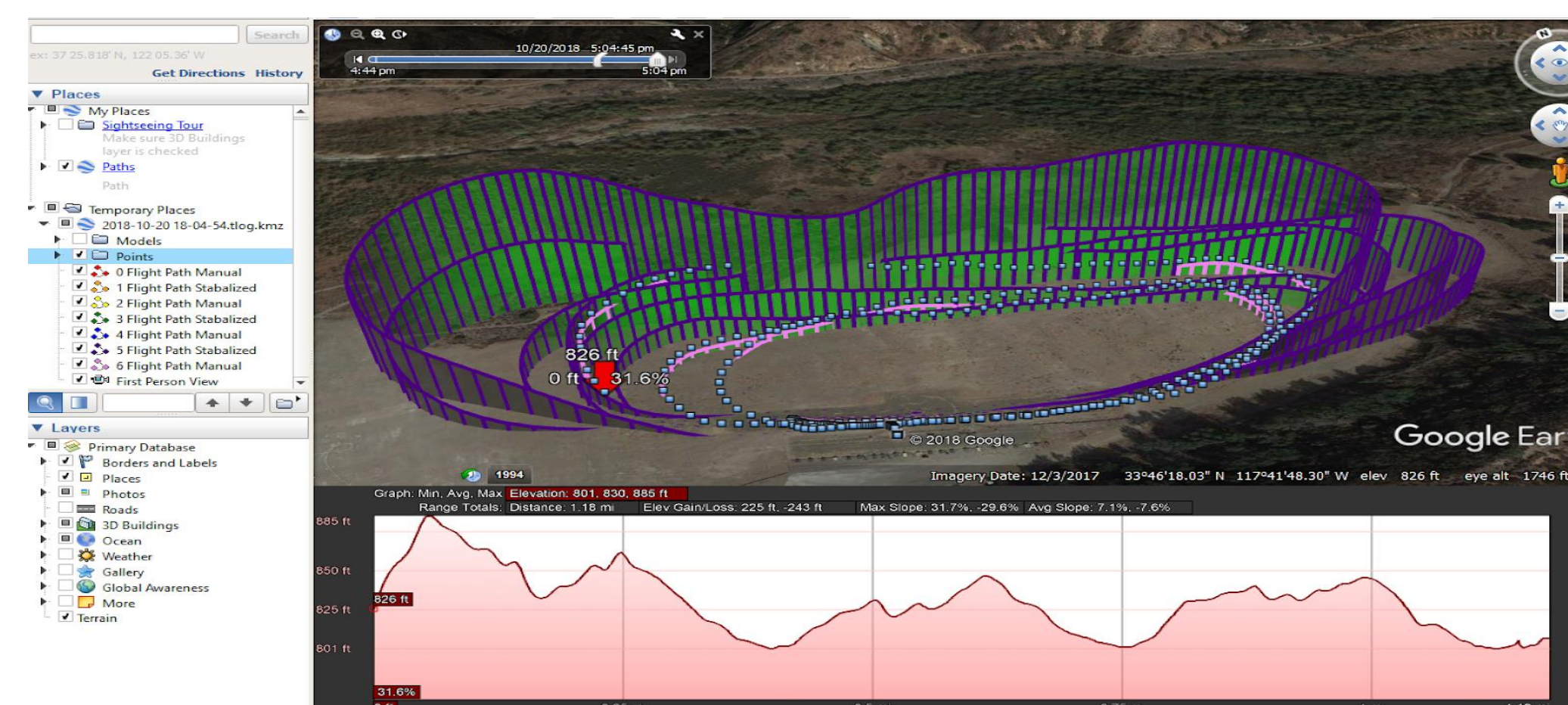
- Flight data & profiles analysis
- Flight parameter tuning
- Camera control module



▲High Level Software Design



▲High Level Hardware Design



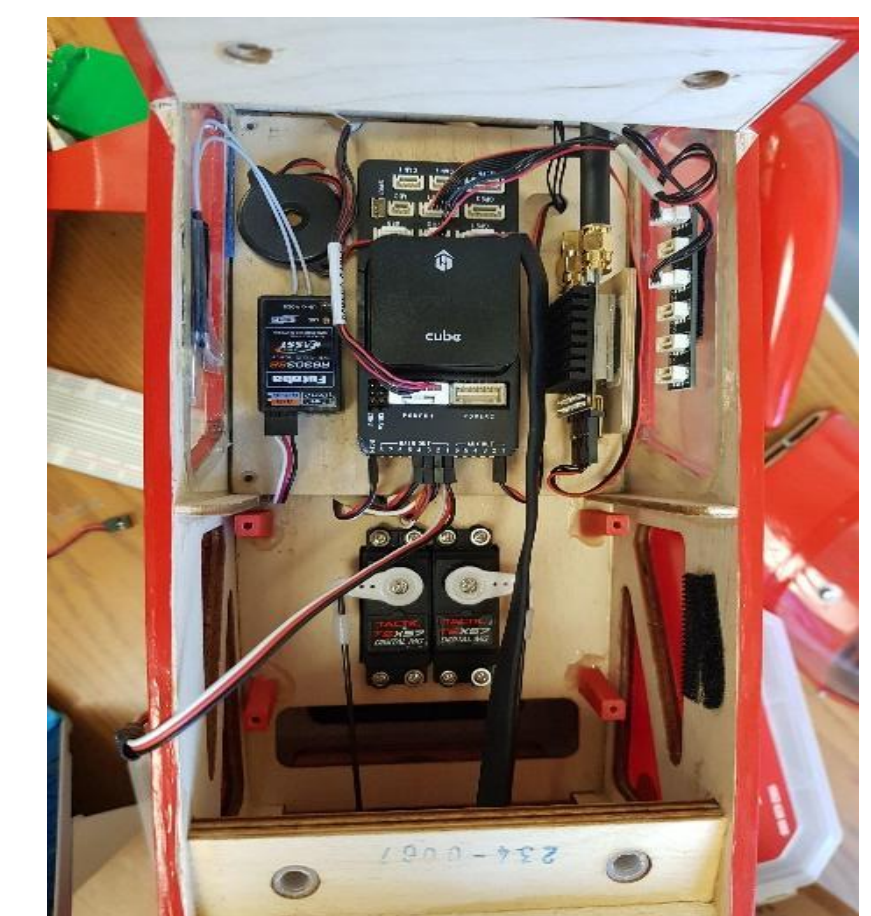
▲Flight Test Result

## Schedule

- Week 3, requirement analysis, system architecture design
- Week 5, First manual flight test
- Week 6, client development & integration
- Week 8-9, data downstream automation, basic flight simulation.
- Week 10, software integration, first autonomous flight test.



▲Test Plane



▲Avionics Compartment

## Goals

### Software:

- Open source software UI integration
- Basic flight automation and simulation
- Obstacle avoiding algorithm
- Computer vision and machine learning module

### Hardware:

- Autonomous flight test
- System test



**UCI Samueli**  
School of Engineering



**UCI Donald Bren**  
School of Information & Computer Sciences