



# **Peregrine Jet UAV**

## **Software Design Descriptions Document**

### **Sponsor:**

Dr. Siddhartha Bhattacharyya

### **Prepared by:**

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9/25/2018

## **1. Overview (Christian)**



## 1.1 Scope

1.1.1 - Data Design - The Software is going to have structures that reside within the software. These structures include, Accelerometer, Gyroscope, GPS, Electronic Speed Control, etc. All these are going to be working off of a Raspberry Pi and a Pixhawk.

1.1.1 - The architecture is based on two things. Data going in and data going out. These two locations are going to be The Ground Station and The UAV.

1.1.2 - The Interface - The Interface is going to be like any other Airplane display. It has to display, speed, altitude, Orientation, etc. The User will have joysticks to control all the motors on the UAV. The Interface will also display live video feed from the UAV.

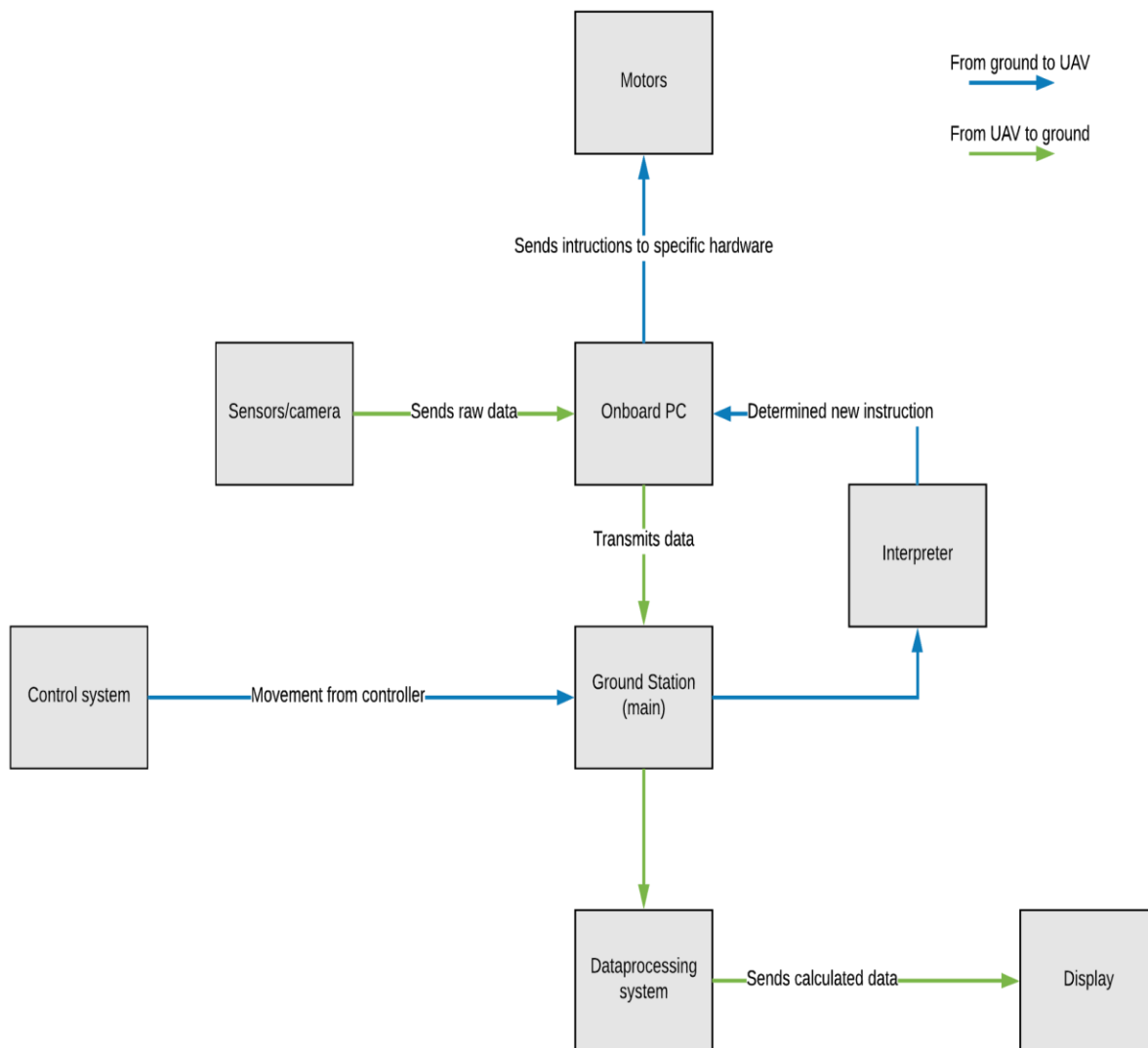
## 1.2 Purpose

The Purpose of creating this software is for Peregrine II. Peregrine II is a Jet UAV that is being built at FIT. The software is going to be used to control and access The UAV.

## 1.3 Intended audience

The Intended audience is Dr. Siddhartha Bhattacharyya and the Software design team for Peregrine II

## 2. UML Diagram



### 3. The modules (Anthony)

#### 3.1 Ground Station

The Ground Station will be a custom built PC, running on Windows, designed to handle large amounts of real-time data processing while simultaneously streaming direct video from and controlling the UAV.



### 3.2 Control System

The Control System will be attached to the Ground Station, and be the primary source of control for the aircraft. It is comprised of a lever for throttle and a joystick for angling the aircraft.

### 3.3 Data Processing System

Once data is packaged and sent to from the UAV and received by the Ground Station, it will run a protocol in order to unpackage and interpret the data it just received. The protocols will be written in Python and remain locally on the Ground Station.

### 3.4 Display

Once data is received by the Ground Station and processed, it will then be displayed on a custom GUI written in Python. The Display will consist of anything the pilot will need in order to safely fly the aircraft.

### 3.5 Motors

The Motors consist of everything from the engine to the wingtips. Anything that can be manipulated using the Control System will be receiving signals from the Onboard PC with direction on what the pilot wishes to do.

### 3.6 Onboard PC

This PC will be located on the aircraft, it will gather and package data from all of the sensors that are aboard. After packaging, the data will be sent down to the Ground Station and displayed.

### 3.7 Interpreter

When new instructions are sent from the Ground Station, the Interpreter translated the data into something readable and executable by the aircraft's Onboard PC.

### 3.8 Sensors/Camera

All sensory equipment is located on the UAV, they collect data from the environment around the aircraft and send the raw data to the Onboard PC.

## 4. Developing interface (Nabil)

