Technical Design Paper

Saint Louis Unmanned Aerial Vehicle

2018 Student Unmanned Aerial Systems Competition

\*insert picture of aircraft here\*

Abstract

This technical paper etc…..

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# Systems Engineering Approach

## Mission Requirements Analysis Andy

**What are we doing, what are we attempting? How do we achieve the goals?**

## Design Rationale Andy

**Team composition and layout**

**Why did we select the components we did**

**How do they intersect and interface**

## Programmatic Risks and Mitigations Matt

**What are the risks? how do we avoid? what is the approach to be successful and safe**

# System Design

## Aircraft Willis

**Why the dragonfly? Why is it the way it is? What are the changes this year?**

**Layout and description**

**Calculations Capabilities**

## Autopilot Josh

**What do we use? Interface?**

## Obstacle Avoidance Holden

**How will we do it?**

**Wont attempt dynamic**

## Imaging System Charlie

**Cammera, triggering issues, gimbal, why that camera?**

For our imaging system, we used a Sony α6000 camera connected to a Raspberry Pi 2 B. We chose the camera because the camera allowed for substantial zoom and quick auto-focus capabilities. Using the gPhoto2 library, we were able to trigger the camera via a USB connection and download the images to the Raspberry Pi storage, as well as control other aspects of the camera’s operation. This allows for rapid transfer of the 24MP images to the Raspberry Pi, where some of the classification takes place before being transmitted to the groundstation.

We did not utilize a gimbal for our camera setup, as the added weight and testing required for proper operation was prohibitive.

## Object Detection, Classification, Localization Alexis

**Flow chart and how**

**Examples**

## Communications Holden

**How do we do all communications**

**Flow chart and how**

## Air Delivery Sarah/Alex

**Design parameters, modifications**

**pressurize bottle**

## Cyber Security Izzy/ Holden

**?????**

# Safety, Risks, and Mitigation Strategies

## Developmental Risks and Mitigation Strategies Katia

## Mission Risks and Mitigation Strategies Jay

# Conclusions