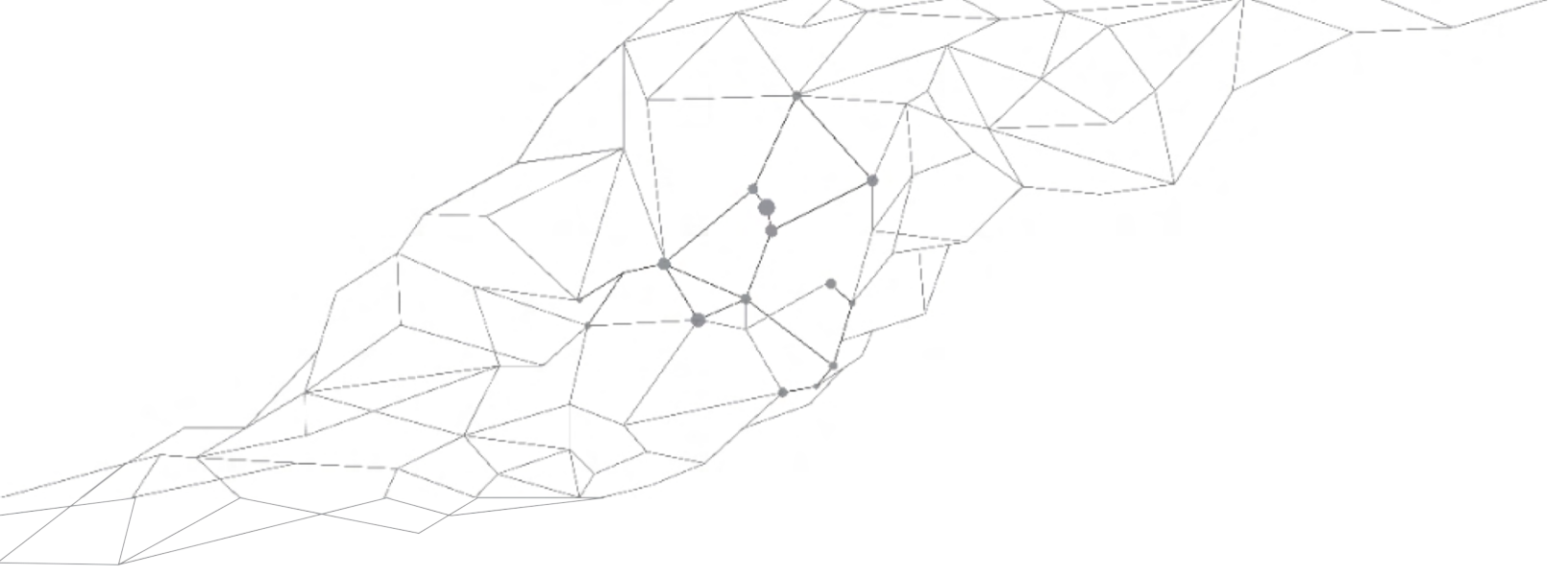


# CU AIR

2023-2024

## SPONSORSHIP INFORMATIOM

## CORNELL UNMANNED AIR SYSTEMS

# TABLE OF CONTENTS



Thank you for your interest in CUAir

# ABOUT THE TEAM

## INTRO

CUAir is a diverse group of highly motivated and dedicated students who aim to stimulate and foster interest in unmanned air systems, technologies, and careers.

## FOCUS

To design and manufacture an unmanned aerial system (UAS) capable of completing various autonomous operations, including waypoint navigation, image processing, air delivery, and target recognition.

To compete in the Association for Unmanned Vehicle Systems International's annual Student Unmanned Aerial Systems Competition (AUVSI SUAS).
To remain at the highest level of innovation and technology, we heavily rely on external sources to further our research and success.

# SUBTEAMS

## > Our Infrastructure

The CUAir team is broken down into eight subteams.

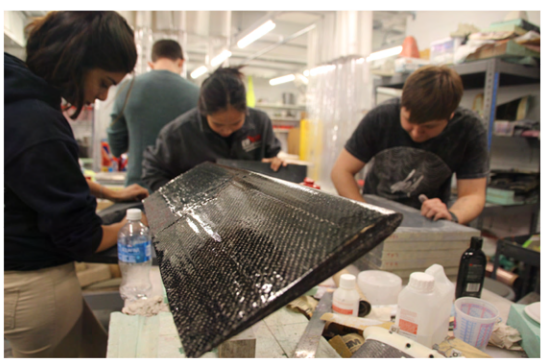
These teams must work together through the the year to design, implement, and present an innovative, custom aerial system to achieve victory at AUVSI SUAS.

## AIRFRAME

The Airframe subteam is responsible for all the aerodynamic components of the plane.

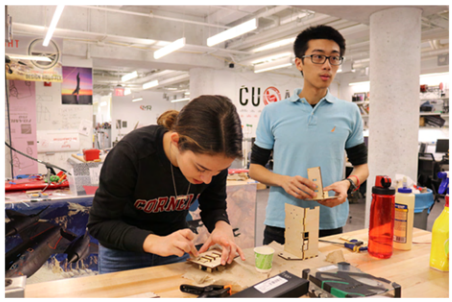
## INTEGRATION AND TESTING OPERATIONS

The Integration and Testing Operations subteam is responsible for testing of aircraft systems and a diverse variety of projects crucial to the aircraft's flight readiness and competition success.



## STRUCTURES AND PAYLOADS

The Structures & Payloads subteam develops the internal mechatronic components of the aerial system.



## ELECTRICAL

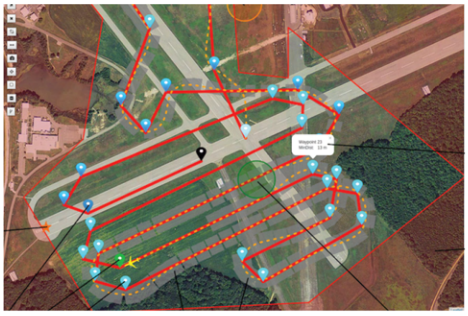
The Electrical Subteam handles the electrical hardware both in the aircraft and on the ground.

## DESIGN AND OPERATIONS

The Design and Operations subteam works on team projects that fall within the intersection between business, technology, and design.

## AUTOPILOT

The Autopilot subteam is responsible for ensuring that the aircraft can perform all necessary maneuvers to fulfill the mission requirements.

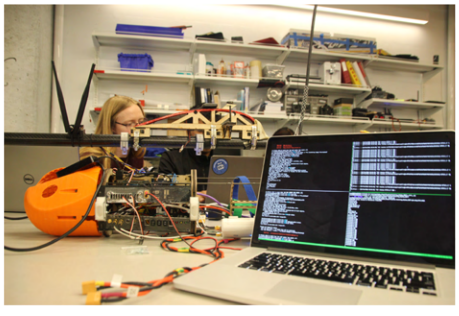


## IMAGING SYSTEMS

The Imaging Systems subteam designs and implements the software infrastructure on the plane's onboard computer and the ground server.

## INTELLIGENT SYSTEMS

The Intelligent Systems subteam manages the system’s object detection, localization, and classification, as well as obstacle avoidance.



# ARTEMIS

Largest and most ambitious airframe in CUAir history.

## CUAir's Competition UAS 2023

### Specifications

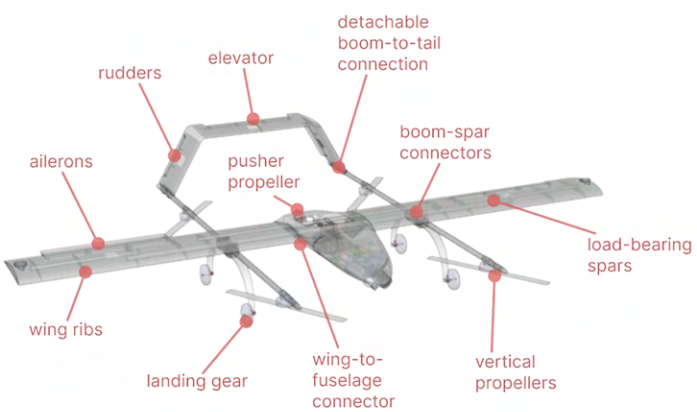
- Double boom, twin props, carbon fiber, aramid honey comb core, fiberglass composite.

| | |
|---|---|
| Length | 2.22 m |
| Weight | 22.0 kg |
| Wing Span | 3.67 m |
| Flight Time | 24 min |
| Cruise Speed | 18.0 m/s |

Highest strength to weight ratio, and greatest payload, stability, and efficiency yet.

### Camera

- Sony R10C with an E384/6 mapping sensor package, allowing for faster data collection and post-processing.
- Mounted on a custom two-axis gimbal, stabilizing the camera and enabling precise targeted image capture.




### Propulsion

- Four T-Motor MN-801-S motors for vertical flight and one Scorpion SII-5535-160KV for horizontal flight.

### Avionics

- Pixhawk 2.1 running modified ArduPilot 4.2 firmware; customized waypoint path following algorithm using Bézier Spline Curves.

# THE COMPETITION

| | |
|---|---|
| WHAT | Annual AUVSI SUAS |
| WHERE | St. Mary's County Regional Airport, California, MD |
| WHO | 70+ Teams from around the world |
| WHEN | June 2023 |

## WHY

### Competition Mission Statement:

"The SUAS Competition, aimed at stimulating and fostering interest in unmanned air systems, technologies and careers, is focused on engaging students in a challenging mission.

It requires the design, integration and demonstration of a system capable of conducting air operations to include autonomous flight, navigation of a specified course and use of onboard payload sensors."


> THE COMPETITION (cont'd)

# THE MISSION

The AUVSI SUAS is broken down into two parts:

## > Technical Design & Flight Readiness Review (TDFRR)

Twenty minute video presentation going through a system overview, tasks planned, expected performance, and test results.

**30% of total score**

## > Mission Demonstration

The team's UAS is deployed and must demonstrate mission requirements, including autonomous way-point navigation, obstacle avoidance, target recog-nition, and air delivery.

**70% of total score**

# ACCOMPLISHMENTS

**2014** — **2nd Place Overall**

- 1st in Mission
  4th in Journal Paper

**2016** — **2nd Place Overall**

- 2nd in Mission
  2nd in Oral Presentation

**2017** — **2nd Place Overall**

- 2nd in Flight Readiness Review
  1st in Journal Paper
  3rd in Mission

**2018** — **4th Place Overall**

- 1st in Flight Readiness Review
  1st in Journal Paper
  4th in Mission

> ACCOMPLISHMENTS (cont'd)

2019

## 7th Place Overall

> 1st in Flight Readiness Review
10th in Journal Paper
10th in Mission

2022

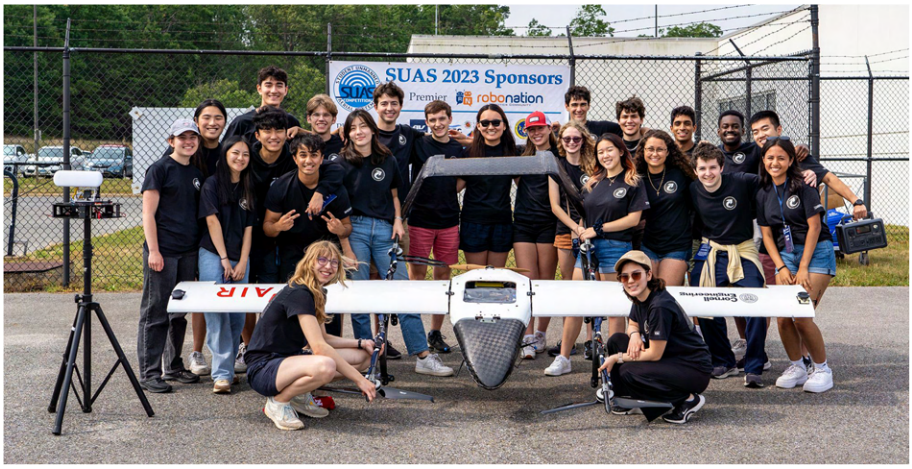
## 8th Place Overall

> 8th in Mission
10th in Flight Readiness Review
Most Innovative Award

2023

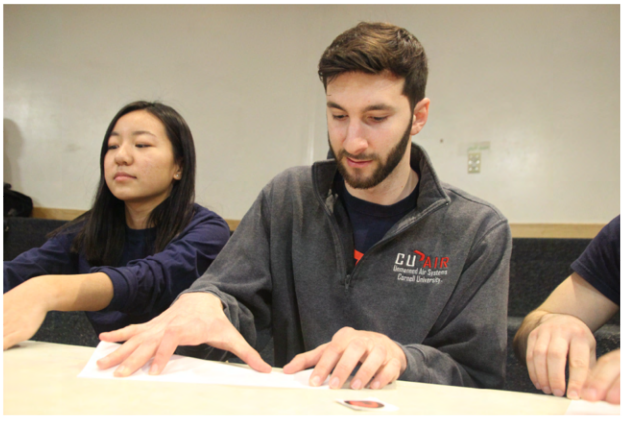
## 4th Place Overall

> 2nd in Mission
4th in Technical Design and Flight Readiness Review
Most Innovative Award



# OUTREACH

Throughout the year, the Design and Operations team hosts events to foster passion for STEM and encourage interest in our team.



CUAir also attends events and collaborates with other organizations to maximize audience reach.

# WHY CONTRIBUTE?

## By contributing you will:

- **Bring students together**
  from across multiple departments and interests to achieve a common goal.
- **Further research**
  and contributions to the field of autonomous unmanned systems
- **Inspire education**
  through real world, practical endeavors outside of the classroom.

# There are advantages for you:

- **Increased recruiting presence**
  on campus, with direct access to all members of the team, each of whom have practical experience in UAS technology and engineering
- **Exclusive CUAir resume book**
- **Increased PR**
  through corporate logos on the aircraft and grateful acknowledgement on the team's website
- **Tax deductible contributions**

# SPONSORSHIP LEVELS

## PILOT

$10,000+

- Resume book
- Large corporate logo on the aircraft
- Priority meeting with any members of the team
- Information session open to the greater Cornell community on behalf of your company
- Large corporate logo on the competition poster
- Personal thank you letter from CUAir
- Acknowledgement on our team website complete with corporate logo

## FIRST CLASS

$4,000+

- Resume Book
- Medium corporate logo on the aircraft
- Information session open to the greater Cornell community on behalf of your company
- Medium corporate logo on the competition poster
- Personal thank you letter from CUAir
- Acknowledgement on our team website complete with corporate logo

# BUSINESS CLASS

$1,000+

- Resume book
- Small corporate logo on the aircraft
- Small corporate logo on the competition poster
- Personal thank you letter from CUAir
- Acknowledgement on our team website complete with corporate logo

# ECONOMY CLASS

$100+

- Resume Book
- Personal thank you letter from CUAir
- Acknowledgement on our team website complete with corporate logo

# SPONSORS

2023-2024


# THANK YOU

# CONTACT US

For more information, please visit our website at cuair.org, or email us at cuair_mae@cornell.edu.

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# THANK YOU.