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# UCI Solar Airplane

UCI Samueli University of California, Irvine

## **Mission Statement**

Contact:

The project seeks to create a solar airplane that proves the viability of solar power as an energy source, as well as make a plane capable of providing assistance in humanitarian aid efforts.

#### **Objectives:**

1. Must be functional

2. Must be powered by solar panels and batteries 3. Must have a flight time extended by 10% beyond its battery life 4. Avionics and Propulsion equipment must be integrated and easily accessible throughout the aircraft 5. Must include functional landing gear and be capable of performing takeoff and landing using the gear

7. Must fit in a standard truck bed (6.5' x 4.2') 8. GPS and camera must be integrated with acceptable video

quality 9. In-flight data must be given via remote terminal

## **Propulsion**

### **Telemetry Features**

**Flight Modes** 

Live location & flight data tracking GPS + Pixhawk

#### Manual - Normal RC

- FBWA (Fly By Wire\_A) Assisted Flying • Loiter - Circles a point and maintains
  - altitude Auto - Follows a mission set by ground
  - station Guided - Seeks a map point without a mission plan already set
  - RTL (Return To Launch) Returns to home location and loiter

## **Full Electrical Circuit**

- Features: Energy Generation
- Signal Transmissio
- Propulsion
- Systems





## **Detailed Analysis**





## 24-25 Design Parameters

Wingspan	8 ft
Aspect Ratio	10.6
Nose to Tail Length	53.4 in
Max Fuselage Area	15.75 ft <sup>2</sup>
Lift to Drag Ratio	9.24
Fuselage Weight	5.53 lbs
Solar Power Generation	6 watts * 28 panels = 168 watts
Fuselage Cd	0.5

## **Results and Conclusions**

By utilizing a more unconventional design compared to last year's iteration of the Solar Airplane, the team was able to increase solar energy generation to extend the flight duration of the plane.

Next year, the team will optimize the plane to further elongate its flight time, as well as implement technologies such as human-detection and heat resistance to work toward our goal of aiding successful humanitarian aid/rescue missions.





LinkedIn: "UCI Solar Airplane Project"

CL vs. AoA

Team Leads - Ann Duong (Project Manager), Steven Nguyen (Chief Engineer), James Moran (Chief Engineer), Harkirat Singh (Aerodynamics Lead), Tiffany Gao (Fuselage Lead), Emmanuel Blvian (Propulsion Lead), Fabian Hernandez (Propulsion Lead). Subteam Members - Aerodynamics: Jason Lee, Brandon Hsi, Andrew Zhang, Justin Cua, Marcus Osorio, Graham Richards, Fuselage: Kevin Harry, Brian Chen, Tristan Reves, Rowan Richards, Hans Buhr, Olivia Wadley, Propulsion: Tianyou Xu, Aditya Karki, Nicholas Taschner, Ishika Narain, Yu-Chueh Wang, Zarin Hasan, Bodhi Pon. Media: Ethan Lovin.