

Design

The purpose of the design is to create an aircraft that can lift as much payload as possible. In order to do this the use of a bi-plane will be used with Gurney Flaps and joined wings integrated into it.

Background

The purpose of this project is to design a heavy lift aircraft to compete in the SAE Aero West competition on April 24, 2015.

Goal

Engineer a low speed, high lift aircraft to compete in the SAE Aero West competition

Requirements

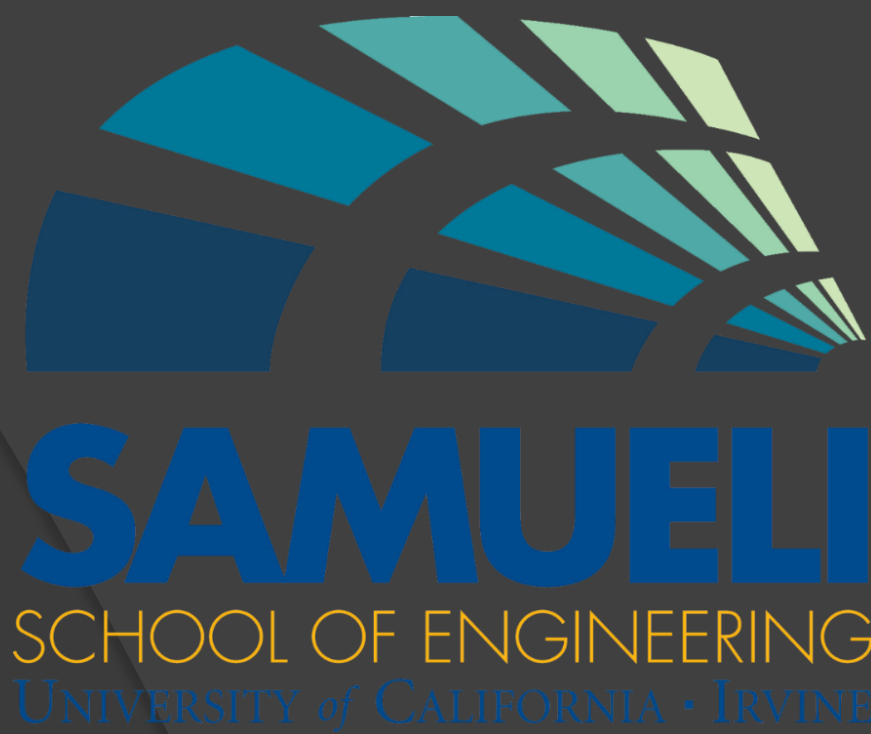
- Sum of height, width, and length less than 175 inches
- No fiber-reinforced plastic
- 1000 Watt power limiter
- Payload bay dimensions-4 x 4 x 10 inches

Team Members/Role:

| | |
|--------------------|----------------|
| Christopher Pratti | Team Lead/Tail |
| Sze Hon Fung | Wing |
| Jared Hatland | Fuselage |
| Dylan Weeks | Fuselage |
| Eric Chi Ho Hau | Controls |
| Joshua Palacios | Tail/LG |
| David Munoz | Controls/LG |
| Jason Won | Motor |
| Trinh Nguyen | Motor |
| Matt Miller | Wing |
| Tristan Macaraeg | Wing |
| Martin Longakim | Wing |
| Itzetzl Frausto | Tail |
| Dylan Jay Huynh | Fuselage |
| Alfonso Arreguin | Wing |

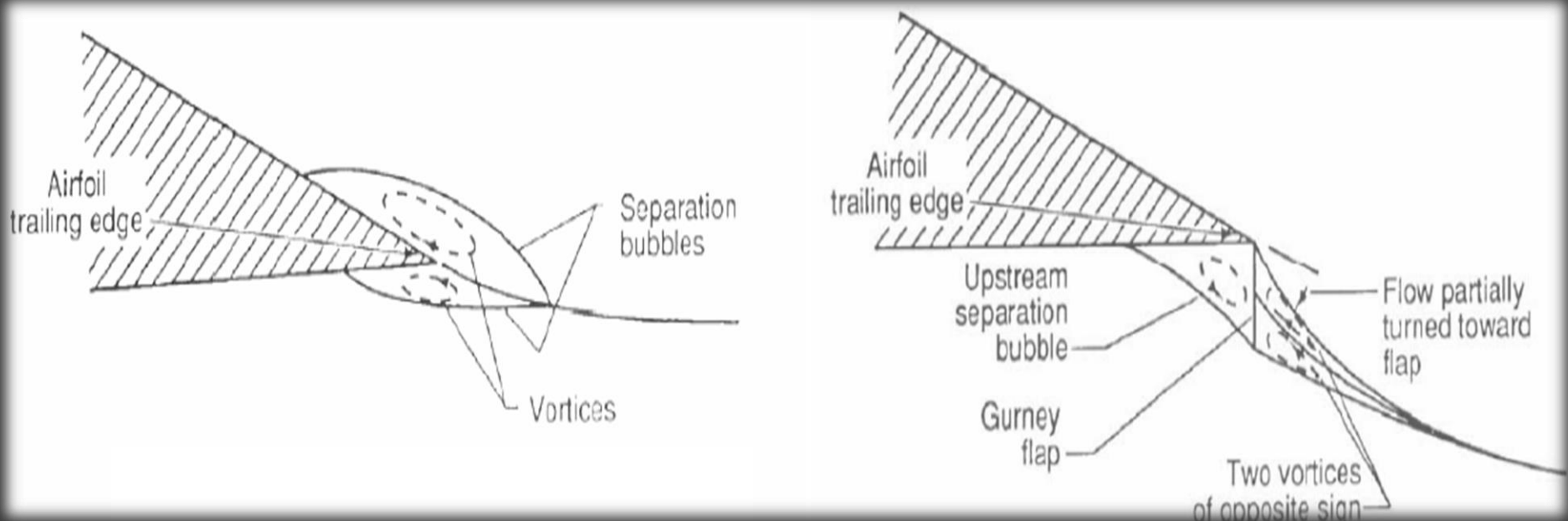
UCI Cargo Plane

Advisor: Professor John C. Larue



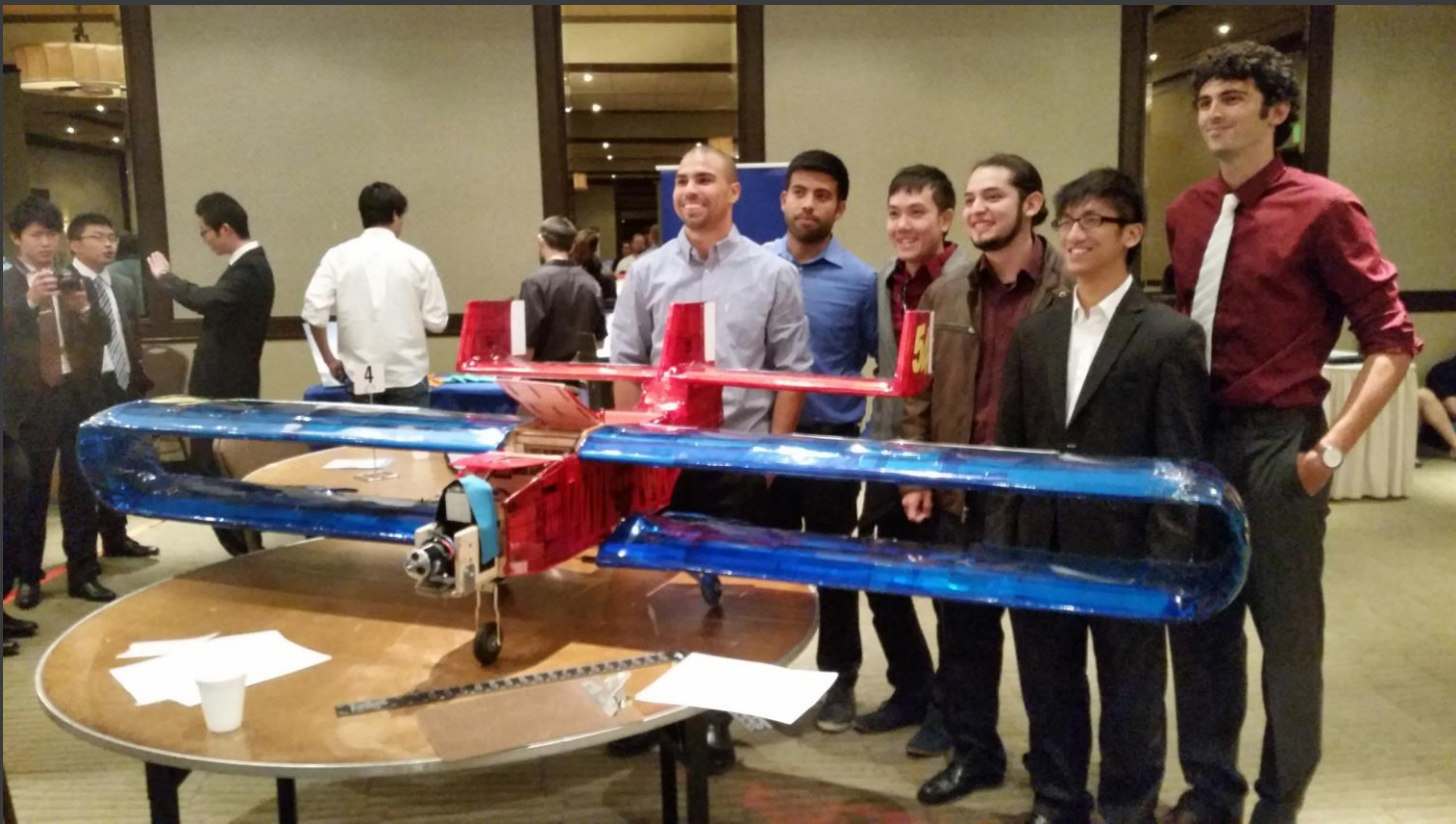
Gurney Flap

The GF is a flat plate placed on the high pressure side of the trailing edge at an angle perpendicular to the chord line of the airfoil. GF increases the pressure on the upstream surface, or the total pressure of the lower surface creating more lift.



Joined Wing

The purpose of the joined wings is to reduce the wing tip vortices in order to reduce the induced drag



SAE Competition Technical Inspection

Tail

The use of triple rudder was implemented into the design in order to reduce on the overall height of the aircraft due to the length requirements.



Fuselage

The fuselage must be designed so that the cargo can be loaded and unloaded in under a minute.

SAE Competition

Encountered problems during takeoff. The airplane suffered a big crash the final round of the competition.

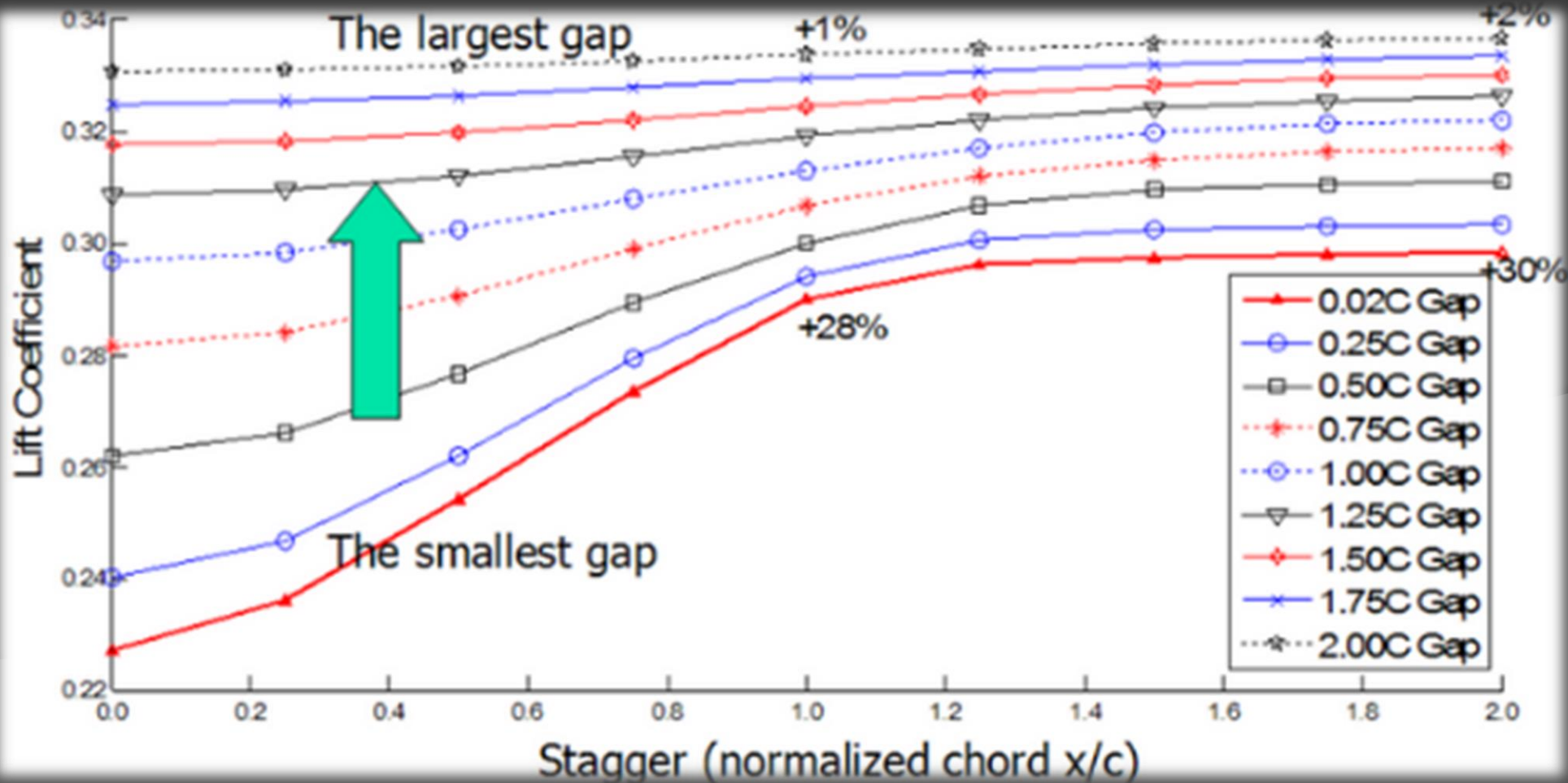
Landing Gear

Tricycle Landing gear. Rear landing was manufactured out of aluminum 6061-t6



Gap and Stagger Effects

Biplane design creates the most lift while preserving the other dimensions



Budget

