University of California, Irvine
"Anteater Express"
Advisor: Professor John Larue
Cargo Plane Senior Design Project
Society of Automotive Engineers
Aero Design West 2019
April 5–7, 2019

Background:

We compete with teams from all over the world by designing and manufacturing an airplane as light as possible to carry cargo and payload. We must use simple materials like wood and metal to construct our airplane. Must fly one lap and takeoff and land using the runway.

Goal and Objectives:

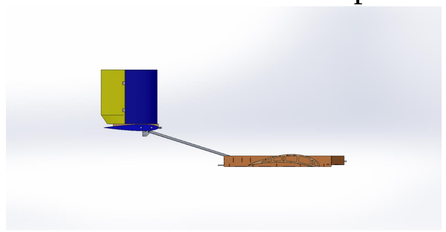
Our main goal is to win this competition, and in order to accomplish this task we are trying to design a plane sooner. This will allow for more testing and revisions. This will allow us to push our design limits.

Requirements:

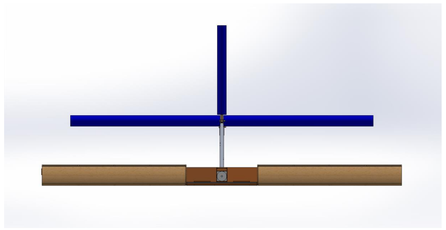
- Maximum 12 foot wingspan
- Maximum takeoff weight of 55 pounds
- Motor power limit of 1000 watts
- Carry0.5lbs of payload for every tennis ball
- No composites

Innovation:

We have drastically reduced the weight volume of our fuselage, which has decreased weight. We opted for rectangular wooden spars instead of metal square tubed spars. We reduced the length of our fuselage and are relying solely on the tail boom to carry the loading on the tail.



Top Image: Side View new Plane
Bottom Image Front View New Plane



Milestone	Due Date	Description
1	11/9/2018	Tail SolidWorks Assembly Complete
2	11/16/2018	Fuselage Assembly Complete
3	11/16/2018	Wing Assembly Complete
4	11/21/2018	SolidWorks Plane Assembly Complete
5	12/14/2018	Tail Manufacturing Completed
6	1/18/2019	Plane Manufactured
7	1/19/2019	First Test Flight
8	1/25/2019	Plane Revision A
9	2/1/2019	Second Test Flight Day (Pending)
10	2/8/2019	Plane Revision B
11	2/15/2018	Third Test Flight Day (Pending)
12	2/22/2019	Plane Revision C
13	2/27/2019	Final Technical Report Due Final Plane Design
14	4/5/2019	SAE Aero Design West Project Presentation
15	4/6/2019	Flight Day 1
16	4/7/2019	Flight Day 2

Current Status:

We are currently at the end of the design phase and will begin manufacturing soon. We have looked int o facilities to be used to help with manufacturing. Plan to have a plane done by end of January.

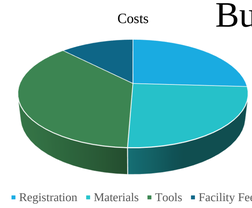
Next Steps:

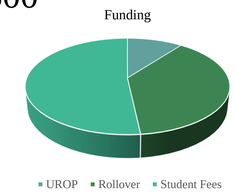
We currently are getting our final design cleared by our advisors and will make any changes necessary. If we want to have time for more testing than the previous year we must manufacture quickly and not waste time. This will allow us the ability to produce revisions.

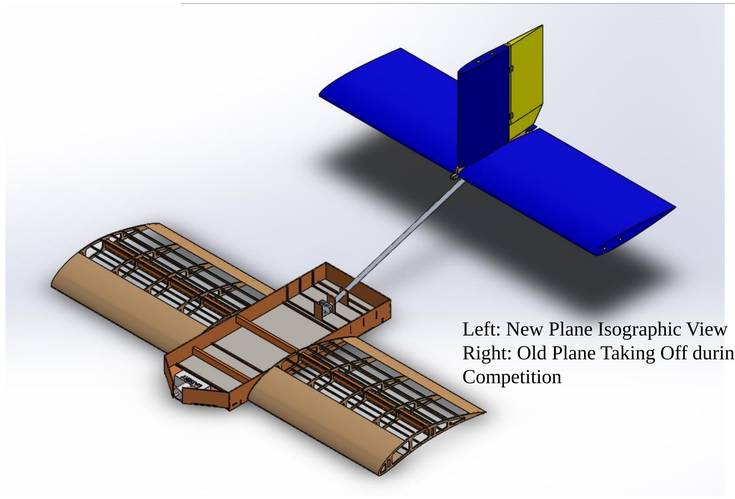
The Bigger Picture:

Last year was the first time we attended the competition ina while and therefore we didn't have much of a basis to design a winning plane. This year we have knowledge of the competition and plane design so we can use last years airplane to help us this year. We kept what worked and revised what didn't. Even if we do not place first, but if can beat the other California universities, that'll be a win in my book.

Budget: ~$7500







Left: New Plane Isographic View
Right: Old Plane Taking Off during Competition

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Austin Ho – Tail Lead
Patrick Huynh – Fuselage Lead
Isaac Ortega – Wing Lead
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