FanFlyer

[1] FanFlyer Design Concept

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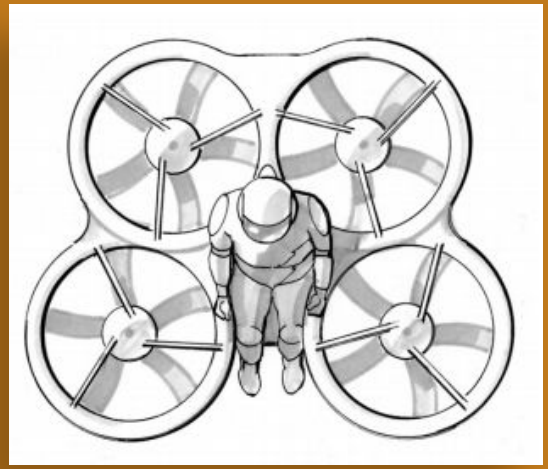
How can we design an airframe for the fanflyer using structural modeling and FEA analysis?



[1] FanFlyer Design Sketch

Project Description

- This purpose of this project is to aid in the design and manufacturing of the structure and structural components of a UAV conceived to compete in the Boeing-Sponsored GoFly contest.

- Our client and sponsor is Novakinetics CEO Jim Corning.

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Background and Benchmarking

- ‘GoFly’ is a Boeing sponsored 2 year competition to generate a personal flying vehicle. Novakinetics has entered the competition and is seeking a Million dollar prize with their design.

- The competition is open to the world and as such the benchmarking is against other global team designs, with various budgets, who made it past the first round trials in year one. This is Year number 2.

- The overall engine design, layout, and external structure have already been decided by NovaKinetcs, so our team is not contributing to that type of benchmark. We are assisting in the internal frame structural modeling.

Customer And Engineering Requirements

Specifications:	
Gasoline Engine Power:	150 HP
Combined Gas Engine and Electric Power (normal):	200 HP
Combined Gas Engine and Electric Power (emergency):	240 HP
Gross Takeoff Weight:	900 lbs.
Empty Weight:	625 lbs.
Useful Load (pilot and fuel):	275 lbs.
Height:	77.1"
Width:	88.3"
Length:	69.7"
Greatest possible dimension measurement:	94"

[1] FanFlyer Design Specifications

Gross Weight:	900 lbs.
Effective Wing Area:	44 sq. ft.
Wing Loading:	20.5 lbs./sq. ft.
Aspect Ratio:	1.8
Pilot Frontal Area in Cruise:	8 square feet
Pilot Drag Coefficient:	.5
Estimated Economy Cruise Speed:	75 kts.
Estimated Maximum Cruise Speed:	100 kts.
Endurance:	1.5 hrs.

[1] FanFlyer Design Specifications

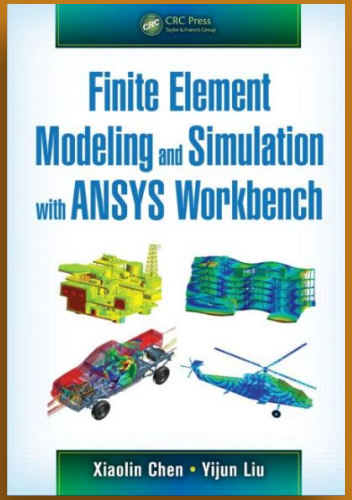
The frame weight target is 50lbs with a limit of 99 lbs

The structure must accommodate an 8ftx8ftx8ft

Budget

- We are planning to purchase FEA books in order to learn how to use Ansys for structural process and evaluation

- There is no monetary budget, because we are being asked to provide computational data and analysis on various materials and designs. This may change as time progresses.



[2] Finite Element Textbook

Meeting Minutes

- Wednesday Sept. 5, 2018 (Team)
- Saturday Sept. 8, 2018 (Team)
- Wednesday Sept. 12, 2018 (Client)
- Wednesday Sept. 12, 2018 (Staff)
- Friday Sept. 21, 2018 (Client)
- Tuesday Sept. 25, 2018 (Team)

Moving Forward

- We will continue to meet with Mr. Corning about our progress while each learning how to perform Finite Element Analysis using Ansys.
- We will continue to add content to and refine the interface of our webpage.
- Begin concept generation for prototype design proposals.
- During our analysis of the frame, design changes for the flyer are allowed to be proposed to Jim Corning

References

[1]FanFlyer Inc., "FanFlyer Potential Technical and Design Discussion," Novakinetics, Flagstaff, Arizona , 2018.

[2] Y. L. Xiaolin Chen, "CRC Press," [Online]. Available: https://www.crcpress.com/Finite-Element-Modeling-and-Simulation-with-ANSYS-Workbench/Chen-Liu/p/book/9781439873847. [Accessed 26 September 2018].