

DE500007

Simple, fast and flexible: Fusion 360 can help you accelerate the UAV prototype design process

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Learning Objectives

- Learn using 2D sketch to create a UAV
- Learn using 3D T-spline to create a UAV
- Learn using both method combined to create a 3D-printed model airplane

Description

Designing and manufacturing the prototype of a fixed-wing drone that can fly stably requires complicated computing, design modeling, and manufacturing processes. These are very difficult, especially for the new students in the aerospace arena. However, Fusion 360 software can help make the workflow simple. Fusion 360 has greatly improved the efficiency and flexibility of drone structure design. Using the models exported by Fusion 360, students can produce the drone prototype through 3D printing, and then assemble the whole aircraft in a very short time. In this class, you'll see the workflow from design to manufacturing and the flight-test scenarios. Find out how Fusion 360 makes it so simple and fast, and helps young students realize their flying dream.

Speakers



Junqi Wu

- Deputy Director of Engineering Training Center of Shanghai Jiaotong University
- Leader of the UAV Teaching and Research Group of the Student Innovation Center of Shanghai Jiaotong University
- Overall designer of UAV, School of Aeronautics and Astronautics, Shanghai Jiaotong University
- Distinguished Expert of Shanghai Aeronautical Association
- Director of Shanghai Aviation Model Association
- Licensed UAV captain



Yutao Jin

- Bachelor of Arts, Shanghai Jiao Tong University, major in visual communication;
- Captain of Shanghai Jiaotong University Aero Sports Club
- Have more than ten years of drone experience.
- A Maker

● Why we choose choose Fusion 360 as our modeling tool

Fusion 360 is a powerful tools for us to build 3D models, we mainly take advantages of these following features:

- Intuitive free-form design tool
- The Design History feature
- Cloud render and simulation
- Multiplayer synchronization
- Free education license

Project 1: Making Your First Quadcopter

You have to learn the basics in fusion 360 before you starting this section. The most intuitive totourial I can fad online is the official ones. Go to this Fusion 360 website and go through the first section <https://help.autodesk.com/view/fusion360/ENU/courses/#3d-modeling>



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Project 2: Organic Drone Design

Though using 2d sketch to making drone is quick and cheap, but the stuff made out of using that method don't look that nice, Mr wu mentioned fusion got some very good surface modeling tool. So why not use that to design a drone.

So this project is essentially the same as the last one, just looks much better



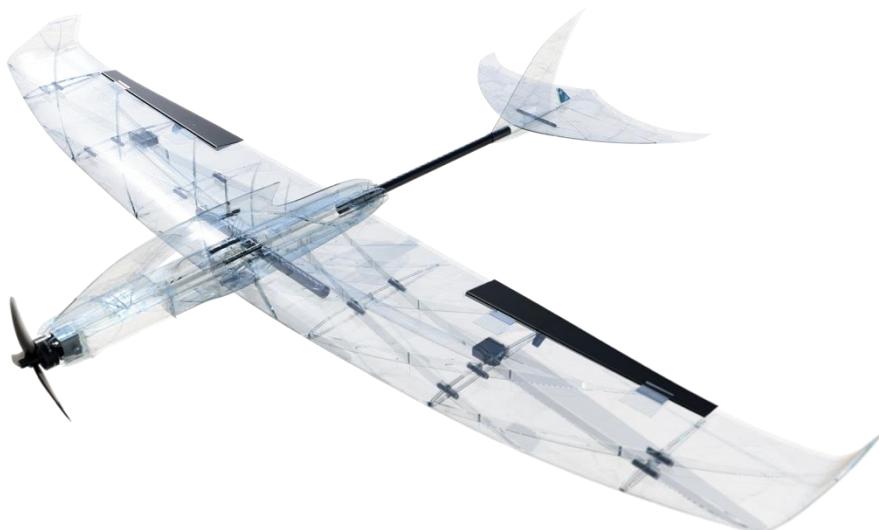
Project 3: 3D-printed Airplane

The traditional method often use a 2d CAD software and is totally fine.

We use fusion to leave the method so we can check the assemble before manufacture process and days of sanding and gluing. Its better but still too cumbersome for prototyping. The plane in the picture takes me and my teammates 8 people 5 days worth of work to design and make.

So we're thinking, we got a lot of 3D printers lying around, why not just print them out, in the development, we go through a lot of try and error. We even got the timeline to have more than 1000 features, but at least we got it simplified and it's easy enough to show you guys and for everyone to try out.

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You should install the plug-in that we need in this project first, you can download the plug-in in this link

<https://apps.autodesk.com/FUSION/en/Detail/Index?id=5447707798035545266&appLang=en&os=Mac>

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PS: We didn't cover many manufacture details in this course, so If you have any question fell free to sent me your question through this address: ttaotaoo@icloud.com