Cornell Engineering

Cornell Autonomous Sailboat Team

Sponsorship Information

2017-2018

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Website: cusail.engineering.cornell.edu

About Us

We are…

22
Students

6
Majors
Across 2 schools

2
Years
As a project team

3
Sailboats
And counting…

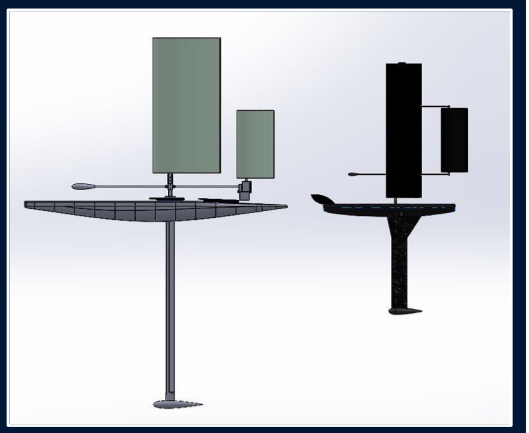
Our Mission…

> *…to develop the means of autonomous sailing and navigation for the benefit of oceanic research and competitive racing.*

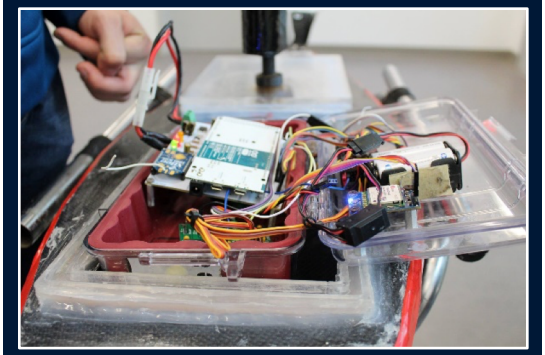
CUSail started as a research project in oceanic data collection, and developed as one of Cornell's Project Teams. Each year, we design and fabricate an autonomous sailboat to compete in the Sailbot competition. Keeping a keen eye on our roots, our long-term goal is autonomous circumnavigation, for the purpose of oceanic and environmental data collection for extended periods of time

Our Goals

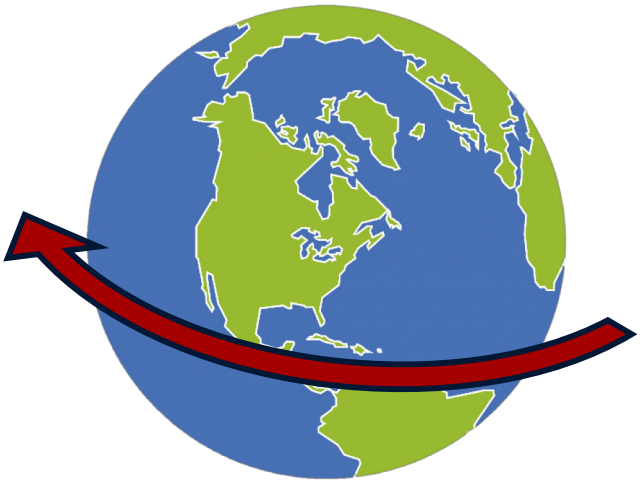
Testing at SailBot 2017



Scale profiles of the 2017-2018 (left) and 2016-2017 (right) designs



The electronics and control module on Sailvane 3, our 2016-2017 design



The Big Picture…

> Gathering oceanic environmental data is **expensive and time-consuming**
  - ✓ Our long-term goal is to develop a **fleet** of low-power **autonomous sailboats** that continuously gather environmental data

> To develop our technology and experience, we compete every year in the **SailBot Competition**
  - ✓ The competition demands control, speed, navigational precision, and ease of use, all of which are essential for oceanic research

Every year, we develop new technologies and techniques, making our sailboats ***smarter, faster, and more robust***

SailBot

The Competition…

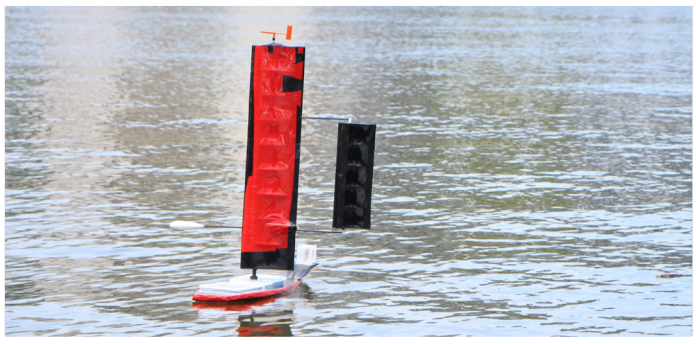
… consists of a presentation and 7 events designed to challenge the control and stability of autonomous vessels less than 2 meters in length.

Navigation Test	Navigate around a series of buoys
Fleet Race	Manual-control regatta race
Distance Race	6 hours of navigating a square course
Station Keeping	Hold a GPS position on the water
Payload	Navigate with a 2 kg weight
Collision Avoidance	React quickly to avoid new obstacles
Search	Find an object within a 100m radius

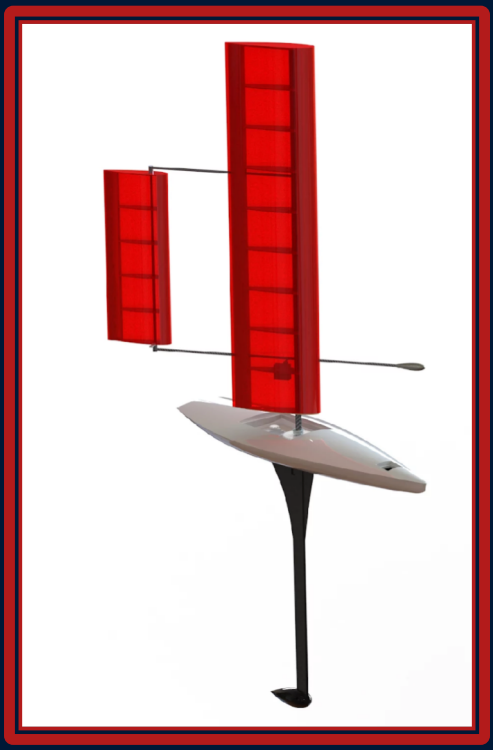
7
Challenges

5
Days

10
Teams
From 4 countries



Sailvane



2015-2016

2016-2017

2018 Design

Rigid Airfoil Sail

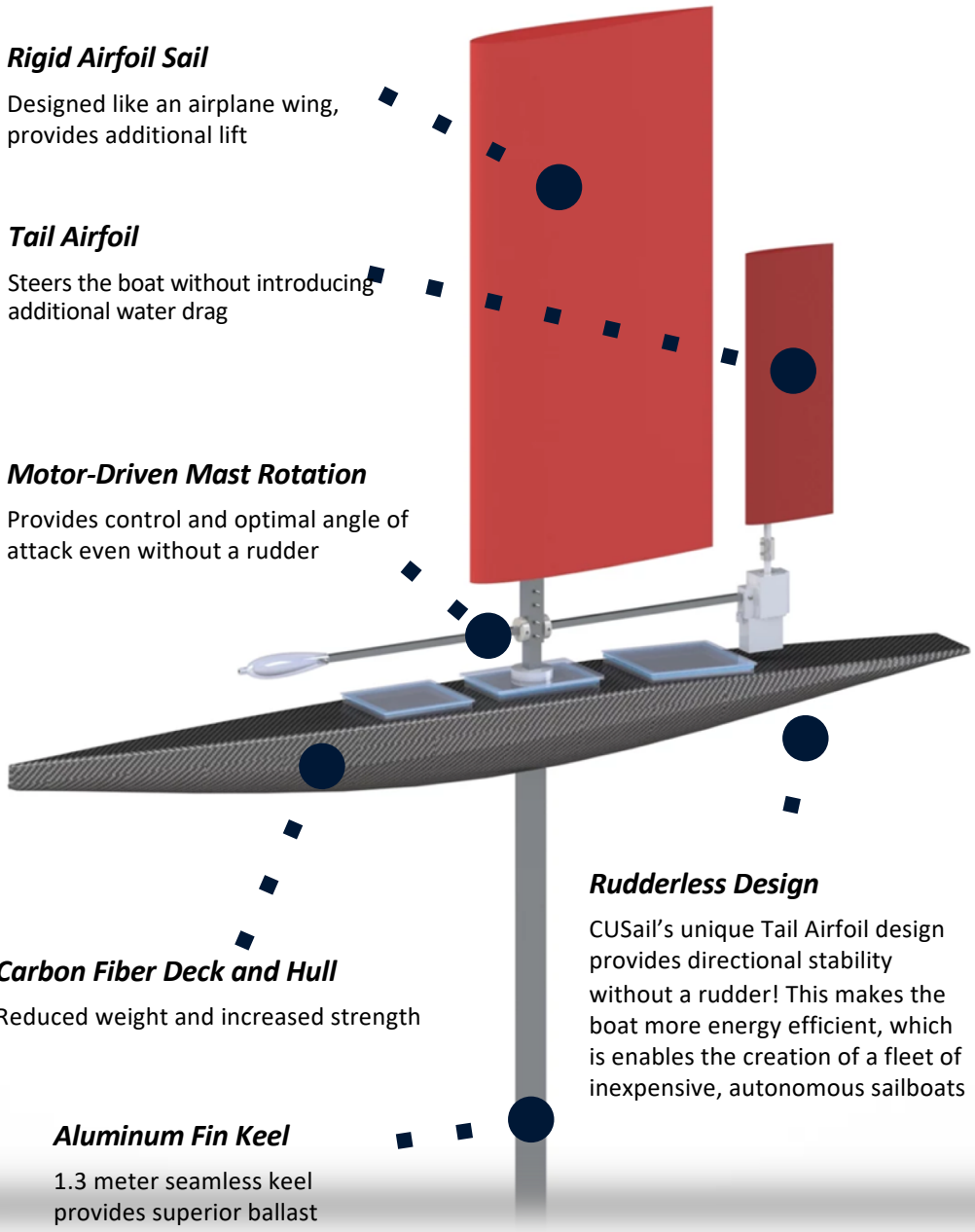
Designed like an airplane wing, provides additional lift

Tail Airfoil

Steers the boat without introducing additional water drag

Motor-Driven Mast Rotation

Provides control and optimal angle of attack even without a rudder



Rudderless Design

CUSail's unique Tail Airfoil design provides directional stability without a rudder! This makes the boat more energy efficient, which is enables the creation of a fleet of inexpensive, autonomous sailboats

Carbon Fiber Deck and Hull

Reduced weight and increased strength

Aluminum Fin Keel

1.3 meter seamless keel provides superior ballast

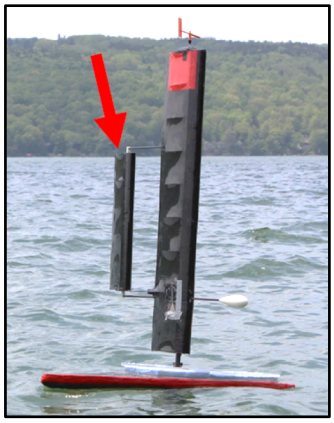
Each year's design…

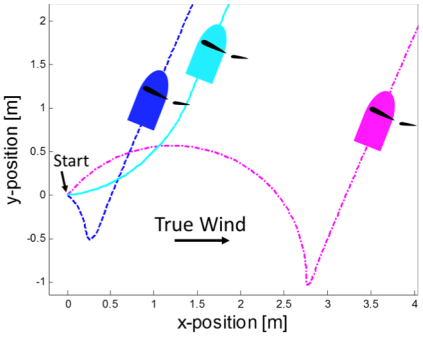
… features new innovations to make the boat more robust, faster, and easier to control. This year, we're maxing out the hull length and keel depth under SailBot competition rules, and using carbon fiber to create a lighter, stronger hull.

Navigation and Control

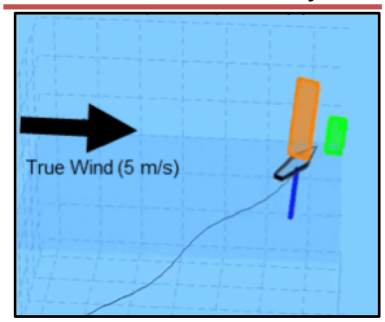
Why use a tail airfoil?

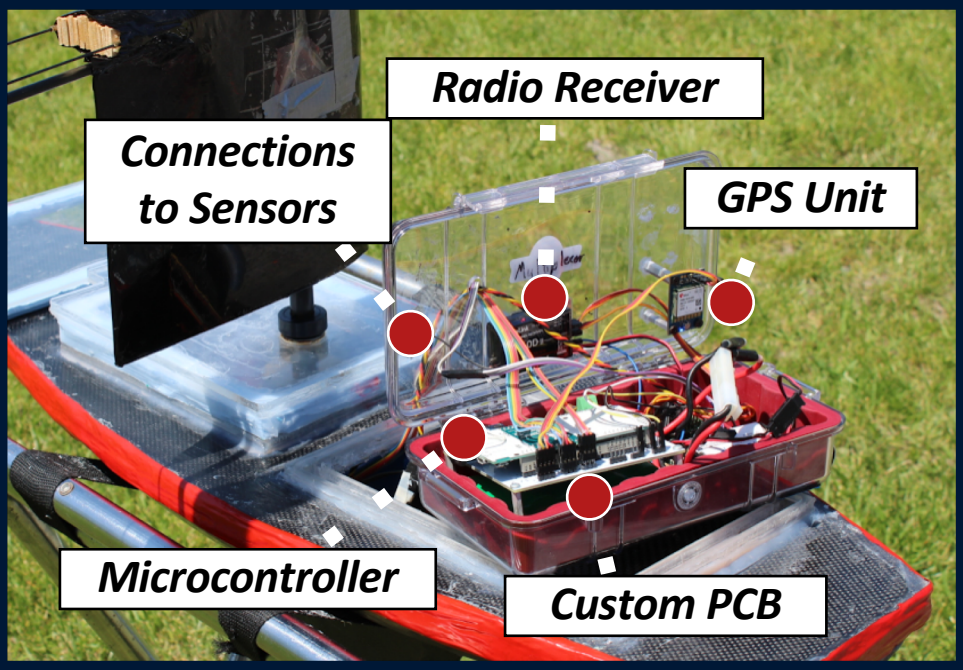
Instead of a traditional rudder, our boats use a tail airfoil, shown below. Our simulations show why…

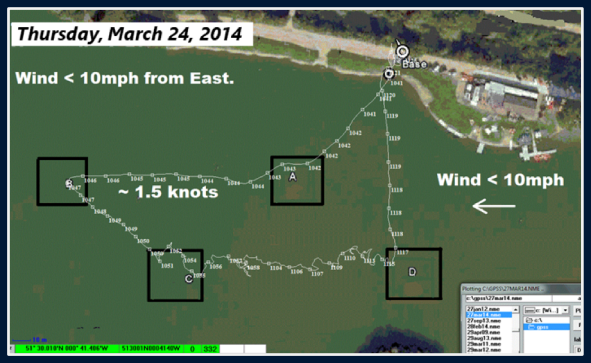




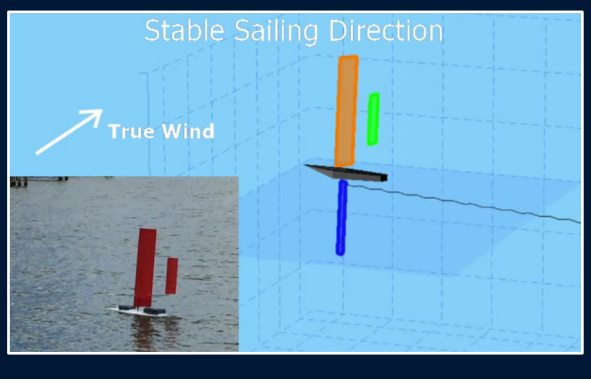
*In order to create a fleet of low-cost sailboats, the boats must be compact and energy efficient. Our simulations show that our Tail Airfoil creates **passive stability** and eliminates the need for a*



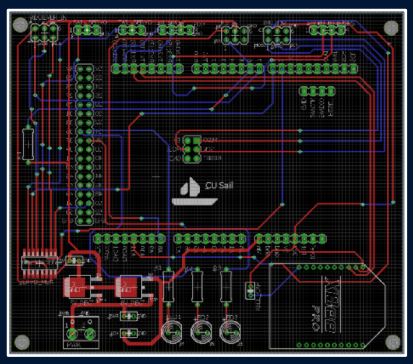




Our electronics system features a custom printed circuit board (PCB), shown at right, which processes the data from the on-board sensors so that the data can be read by the on-board microcontroller.



CUSail's control system is innovative and robust. Our control system uses a system of GPS feedback and digital waypoints to navigate long distances and complex courses.



Each year, we simulate our sailing conditions using MATLAB and Python to maximize the efficiency of our control system.

Sponsorship

Sponsoring our team has a number of benefits for your organization. Exposure within Cornell Engineering's community establishes your organization as an innovator, and provides you access to some of the brightest young minds in engineering. The collaboration and growth through CUSail would not be possible without the continuing support of our sponsors!

Your contribution…

- ✓ Enables young engineers to learn beyond the classroom
- ✓ Fuels the development of unmanned, continuous oceanic research
- ✓ Grows the field of autonomous sailing and transportation
- ✓ Puts your organization at the forefront of innovation
- ✓ Puts your logo at the heart of Cornell Engineering
- ✓ Is tax-deductible

Sponsorship Levels

Thank you to our Sponsors!

Platinum Sponsor

Cornell Engineering

Gold Sponsor

DUNA-USA

Silver Sponsor

SOLIDWORKS

Silver Sponsor

Bentley Sustaining Infrastructure

And, potentially, your company!

Bronze
$250+

- Company name placed on list of sponsors on publicity information

Silver
$500+

- Small logo on all publicity materials and presentations
- Access to team resume book
- Logo with link to your homepage on our website

Gold
$1000+

Benefits from Silver Level, plus…

- Medium logo on publicity materials and presentations
- Small logo on the boat's sail
- Thank-you plaque
- Mention in post-season press release

Platinum
$2000+

Benefits from Gold Level, plus…

- Priority large placement of logo on the sail of the boat
- Large, top level placement of company logo on team presentations
- Special thanks during press releases and presentations

Donations can also be made in the form of discounts or donation of materials

Please see the following donation form for more details

Donation Form

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CUSail is a 501(c)(3) tax-deductible organization.

Do you require a charitable donation receipt?

[ ] Yes [ ] No

Signature: _____ Date:

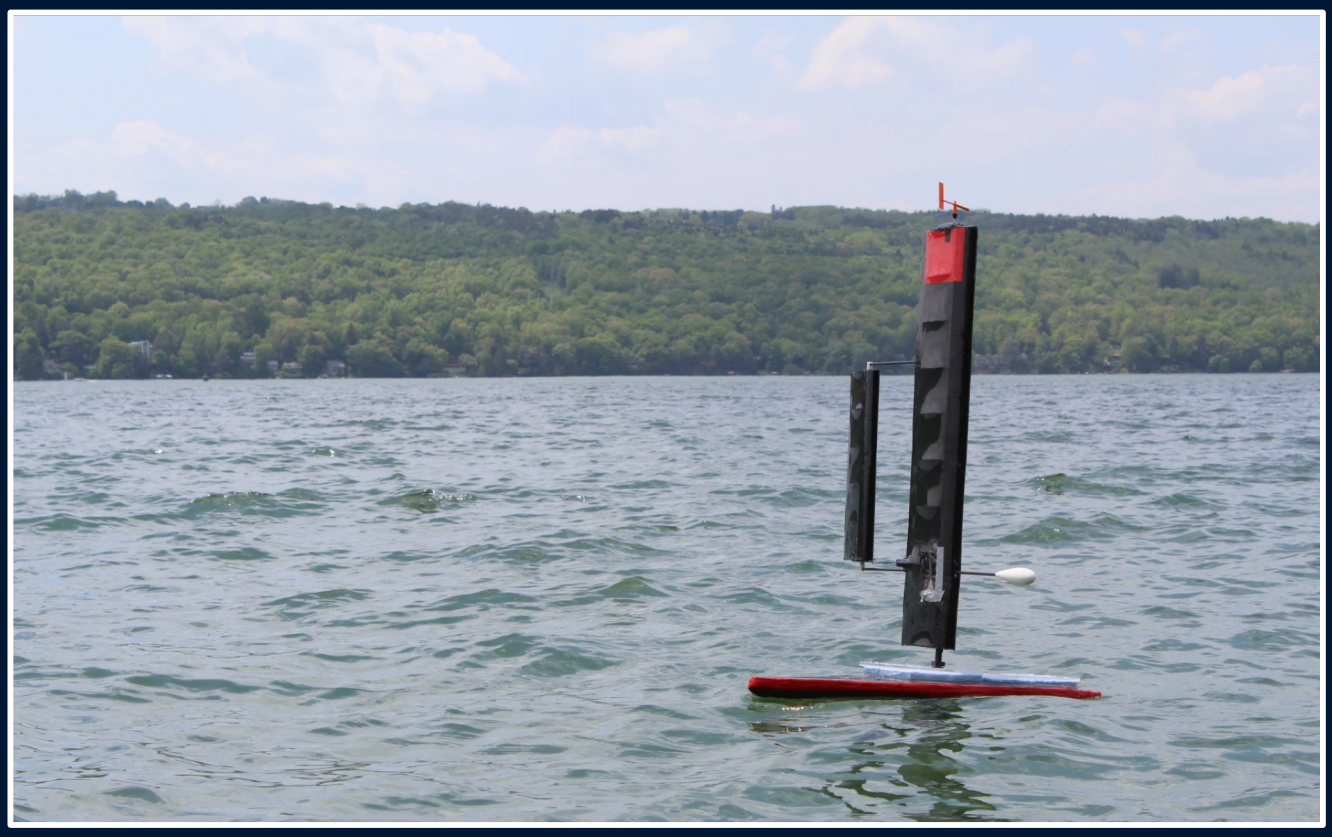
Instructions: If you are donating a monetary contribution, please print out the above form, enclose your check made out to "**CUSail**", and mail to the below listed address. If your donation is a gift in kind, please estimate the value of the gift in kind and enclose **documentation of donation** (receipt, coupon, or other document listing the details of the donation) and mail to the below-listed address.

Please mail forms and checks, made out to "**Cornell University**" with a memo "**CUSail**" to:

Kae-Lynn Wilson
141 Upson Hall
Cornell University
Ithaca, NY 14853

If you have any questions, please contact:

Mary Essex
Full Team Lead
mae87@cornell.edu



Thank You!

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