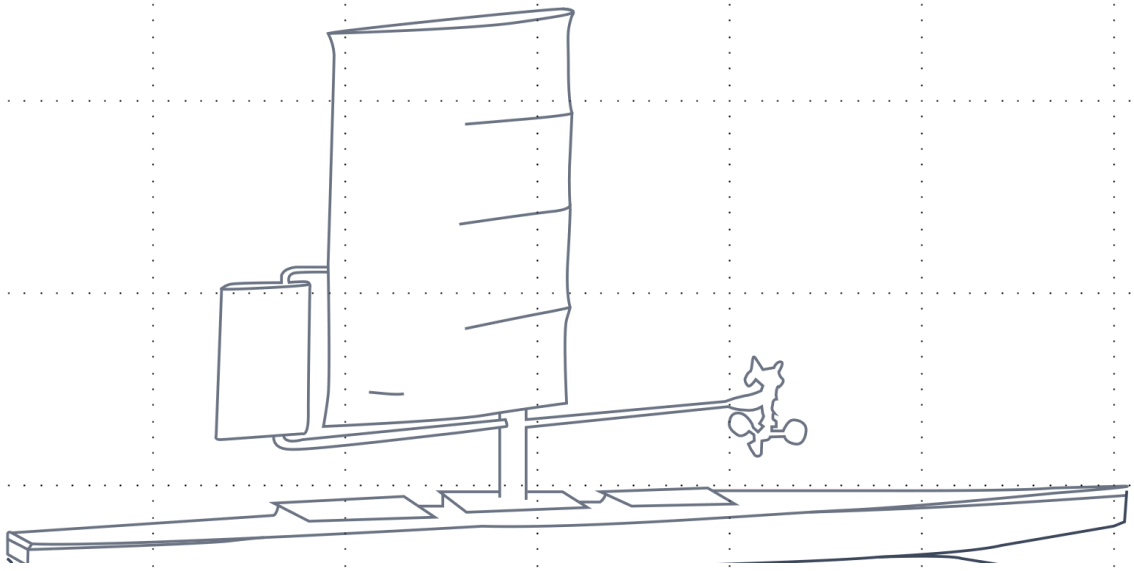
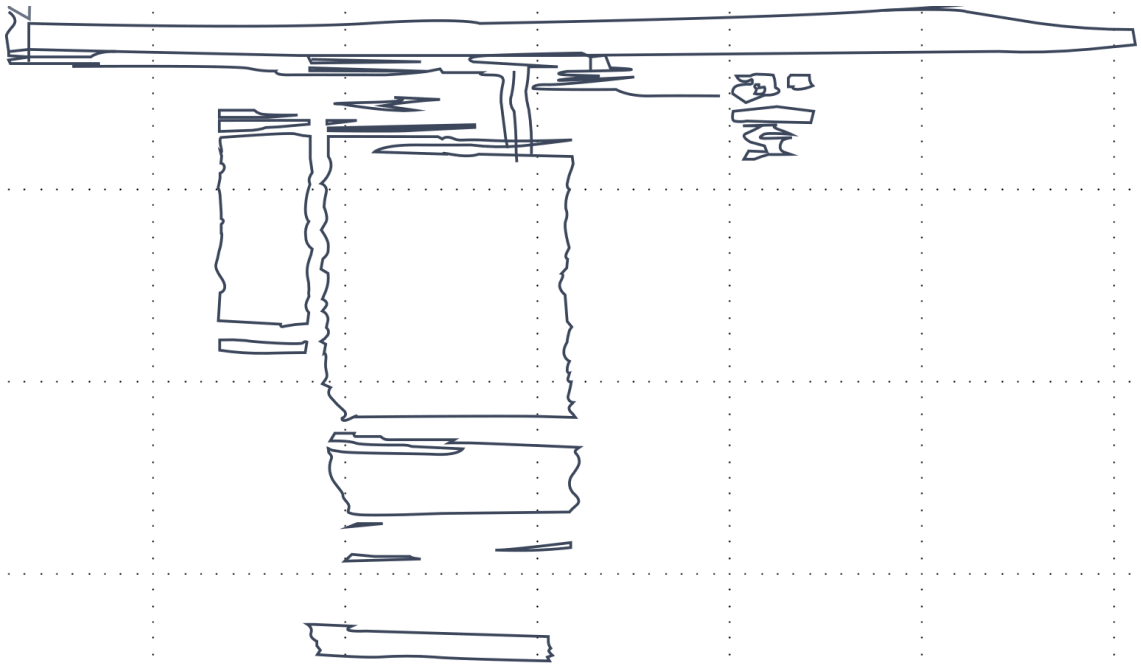


cusa

Cornell Autonomous Sailboat Team
Sponsorship Packet 2019-2020



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ABOUT THE TEAM

Starting as a research group led by Professor Andy Ruina in 2014, CUSail has grown into a student-led project team that is over 20 members strong.

CUSail offers students across many disciplines the opportunity to apply what they have been learning in the classroom to real world engineering problems of tomorrow. Using cutting-edge technology and advanced mechanical design, our team is exploring the uncharted waters that is the field of autonomous sailboats.

THE COMPETITION

Our boat will compete at the SailBot International Robotic Sailboat Regatta in Newburyport, MA in the summer of 2020. The competition is comprised of seven challenges over five days against American and international collegiate teams.

THE EVENTS

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
COLLISION AVOIDANCE	React quickly to avoid new obstacles
PAYLOAD	Navigate with a 2 kg weight
SEARCH	Find an object within a 100m radius

LONG-TERM GOALS

SAIL THE LENGTH OF CAYUGA LAKE

The first goal in our series of long-term goals is to sail from the southern end of Cayuga Lake in Ithaca, NY to the northern end in Cayuga, NY. Cayuga Lake is just under 40 miles long, and we would be able to test our navigation algorithm and sailing endurance on a larger scale.

GLOBAL FLEET OF AUTONOMOUS SAILBOATS

CUSail's ultimate goal is to create a fleet of autonomous sailboats. We want to perfect our mechanical design so that we can easily build many sailboats at a low cost. The boats could monitor weather trends in different parts of the world or track whale migration patterns.

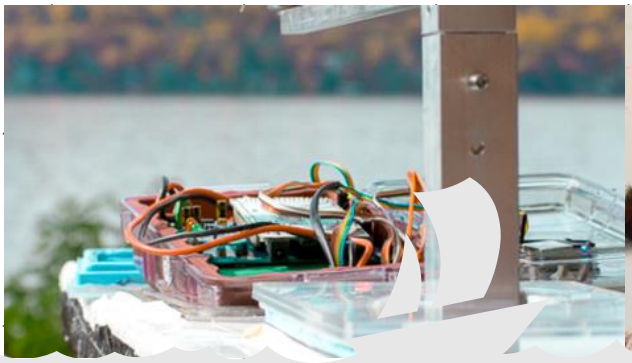
CROSS THE ATLANTIC OCEAN

We want to sail across the Atlantic Ocean from New York to Portugal to demonstrate that our boat is robust enough to survive ocean and weather conditions, and prove that our navigation algorithm can successfully navigate with such a long planned route.

NAVIGATION SUBTEAM

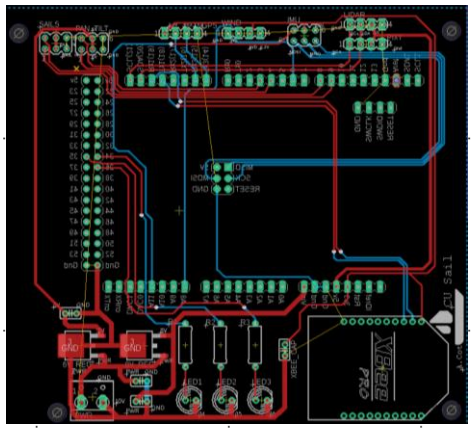
Devin Dean, Kurt Huebner, Troy Smith, Max Ren, John Winnicki, Jamie Poole, ***Diane Sutyak****, Mahika Kudlugi, Katelin Chan, Marissa Rubb, Beth Mieczkowski*
Not pictured: Everett White, Rachel Brotherton

The Navigation subteam works with all electronics and software on our boat. Our boat's autonomous capabilities rest on two major pillars: gathering data from its environment and executing calculated decisions. An array of sensors allow detection of global position, wind direction, and boat direction. The Navigation subteam uses data from these sensors to devise an algorithm, allowing our boat to navigate. The subteam also designs sub-systems for land communication with our boat, data logging, and efficient power distribution.

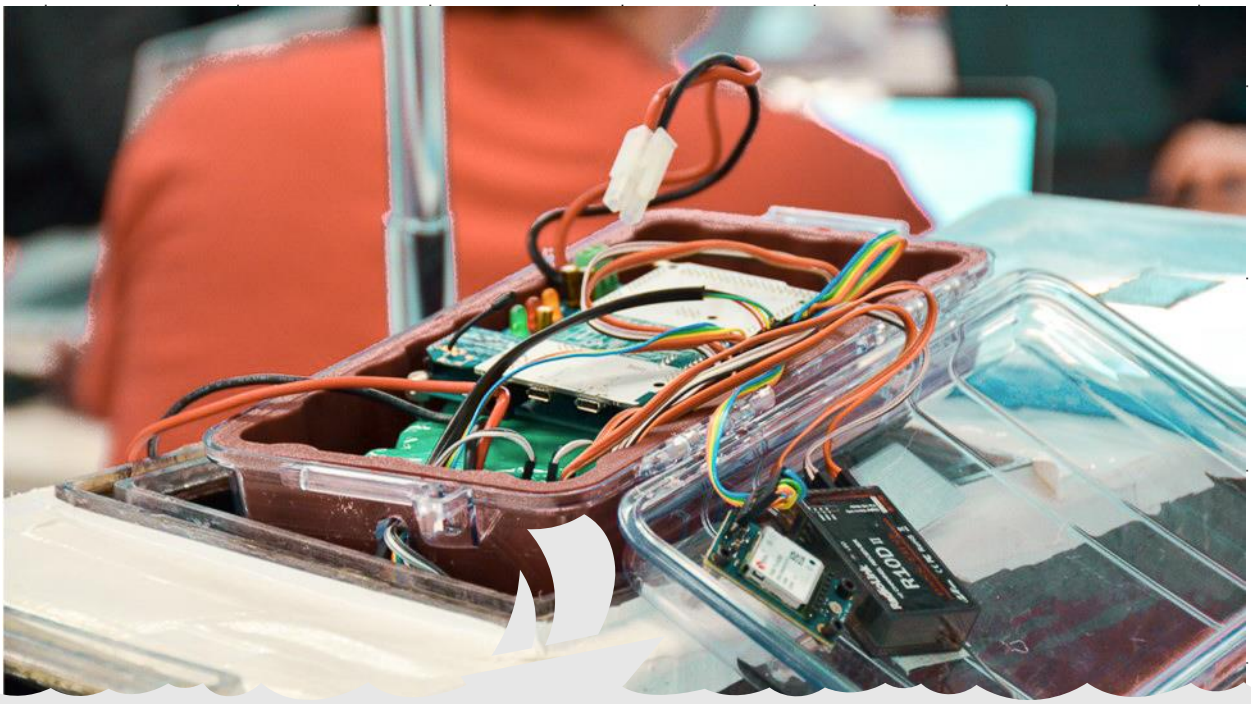


NAVIGATION DESIGN 2019-2020

- Arduino Due microcontroller with Atmel SAM3X8E processor
- Lightware SF11 LiDAR Sensor
- Inertial Measurement Unit to calculate boat direction
- PixyCam for obstacle detection
- Xbee-Pro S3B modules for communication between the boat and basestation (PC)



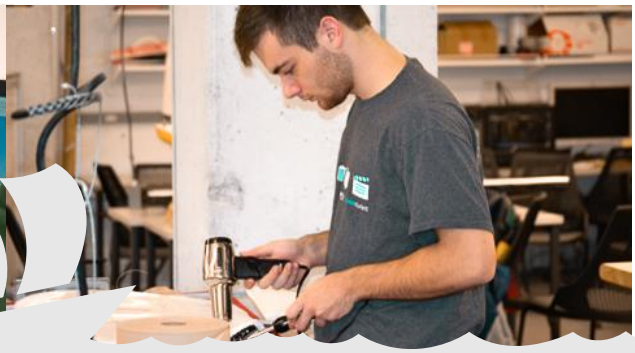
PCB Layout



MECHANICAL SUBTEAM

Nick Allen, Chris Kutil, Devin Dean, Mary Essex, ***Katherine Gray****, Alex Merrill, Rachel Han, Madeline Dubelier, Claudia Buchard, Mary Augenstein*

The Mechanical subteam is responsible for designing and manufacturing all of the mechanical components of the boat. The team members work on tasks like redesigning the deck and hull to increase waterproofing reliability and gain skills such as rapid prototyping, machining, and composite and mold making. Working on the mechanical team involves constant problem solving and hands-on skills as well as an advanced technical understanding of the boat.

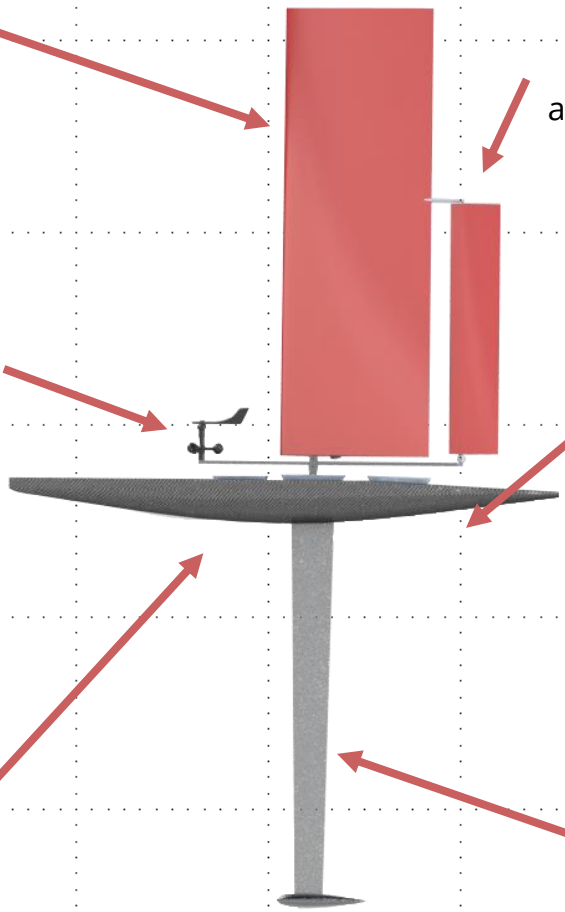


MECHANICAL DESIGN
2019-2020

RIGID AIRFOIL SAIL
Designed like an airplane wing, provides additional lift

MOTOR-DRIVEN MAST ROTATION
Provides control and optimal angle of attack even without a rudder

CARBON FIBER DECK AND HULL
Reduced weight and increased strength



TAIL AIRFOIL
Steers the boat without introducing additional drag forces

RUDDERLESS DESIGN
Unique tail airfoil design provides directional stability without a rudder

ALUMINUM FIN KEEL
1.3 meter seamless keel provides superior ballast support

BUSINESS SUBTEAM

*Rachel Han, **Crystal Wu**, Mary Essex, Jackson Kopitz*

The Business subteam is a multi-disciplinary team that manages funding and operations for the team. We create the team's budget and manage team finances. The Business subteam also works to obtain all sponsorships from corporations and individuals. We design the team website, brand, and merchandise in addition to being responsible for team photo and video documentation and administrative tasks.

SPONSORSHIP
CONTRIBUTOR LEVELS

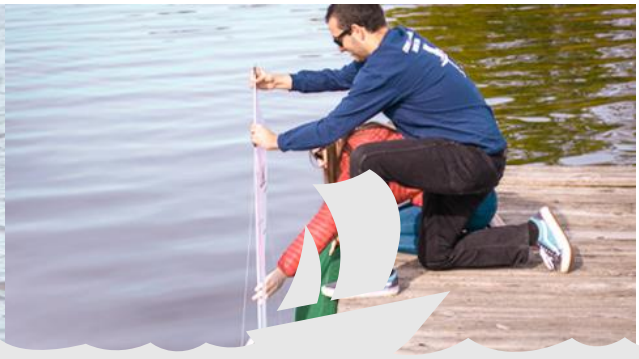
DINGHY
$100+
- Personal thank you note
- Logo on website

MOTORBOAT
$500+
- All above benefits
- Small logo sticker on sail

YACHT
$1000+
- All above benefits
- Medium logo sticker on sail
- Team Resume booklet

AIRCRAFT CARRIER
$5000+
- All above benefits
- Large logo sticker on sail
- CUSail sponsored information session on campus

CONTRIBUTIONS ARE TAX DEDUCTIBLE!



DONATION FORM

Donor Information

Name / Organization: _____

Organization Address: _____

_____

Telephone Number: _____

E-Mail Address: _____

Organization Website: _____

Donation Information

Monetary Donation Amount: $_____

Fair Market Value of Gift in Kind: $_____

**Donations to CUSail are tax-deductible.*

Do you require a charitable donation receipt?

[ ] Yes [ ] No

Signature: _____ Date: _____

For Gifts in Kind: If your donation is a gift in kind, please estimate the value of the gift 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:

Jackson Kopitz
Full Team Lead
jsk363@cornell.edu
Crystal Wu
Business Team Lead
cw683@cornell.edu

THANK YOU
FOR YOUR SUPPORT!

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