JAVIER FARIAS

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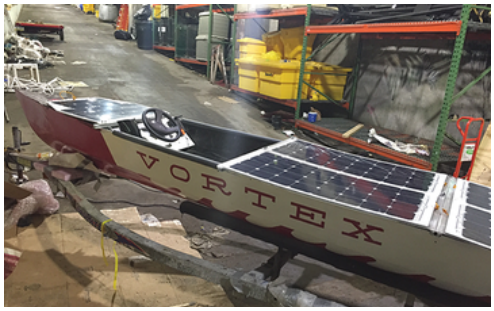
SOLAR SPLASH - CARNEGIE MELLON SOLAR RACING



What?

- Fabricated **boat hull** for a solar racing competition out of **carbon fiber**
- Performed a needs analysis to initiate the design process

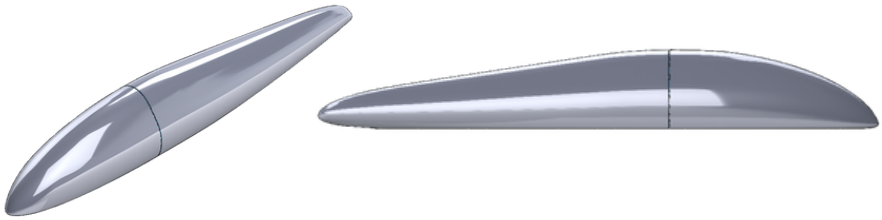
How?

- Built small scale **prototypes** to test ideas
- Made a female mold out of foam and Duratec StyroShield

Results

- Finished 11th overall completing a 200 meter speed trial in 20.63 seconds and an endurance trial lasting 17 kilometers on purely solar power

BUGGY RACING - CARNEGIE MELLON SWEEPSTAKES



What?

- Raced unpowered **carbon fiber** vehicles in yearly race
- Custom built buggy to fit our driver

How?

- Designed on **SolidWorks** using driver measurements
- Used **acrylic** molds made with a **CNC** machine

Results

- Finished 1st overall out of 23 teams
- Reached a top speed of 40mph

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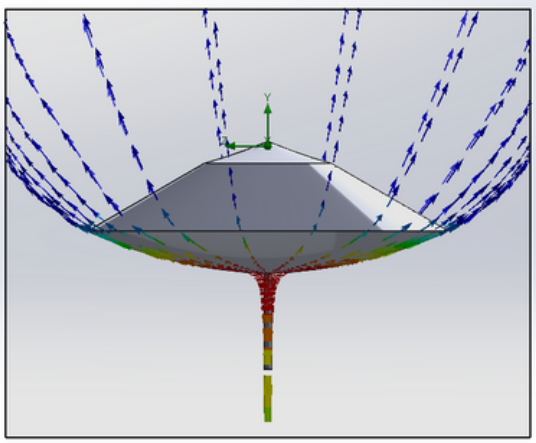
SENIOR CAPSTONE - MECHANICAL DESIGN



What?

- Created a wind resistant umbrella prototype that does not flip inside out
- Conducted user surveys and field tests

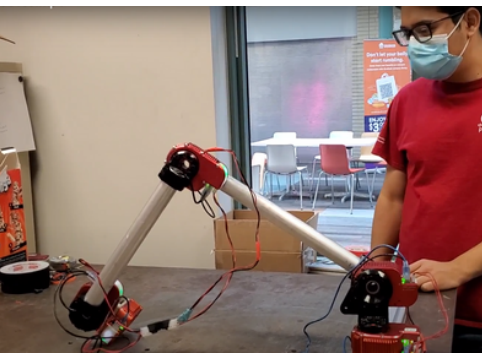
How?

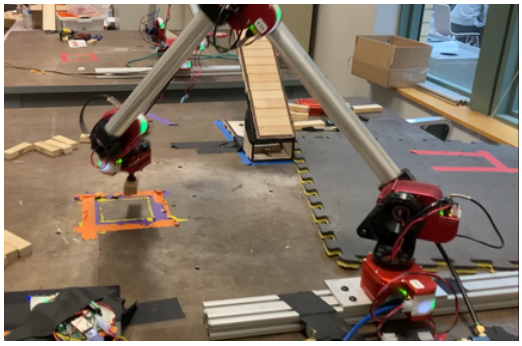
- Used **SolidWorks CFD** and **FEA** features for design
- **3D Printed** parts for rapid prototyping and to meet deadlines

Results

- A large, lightweight umbrella weighing 2.3 pounds capable of resisting winds of up to 45mph without inverting

ROBOTICS CAPSTONE - ROBOT KINEMATICS AND DYNAMICS





What?

- Programmed a robotic arm to stack a Jenga tower as high as possible in 3 minutes

How?

- Fine tuned the arms **PID** controller to ensure stability
- Used a series of waypoints and **inverse kinematics** to map out the arms path

Results

- Stacked a Jenga tower 6 layers high in under 3 minutes with high precision

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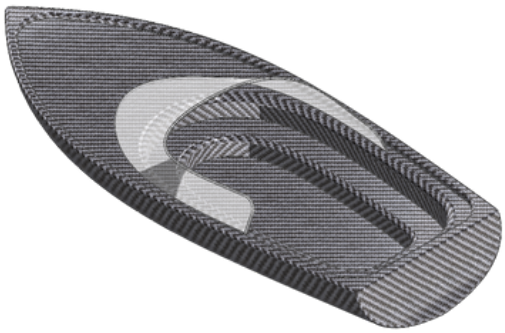
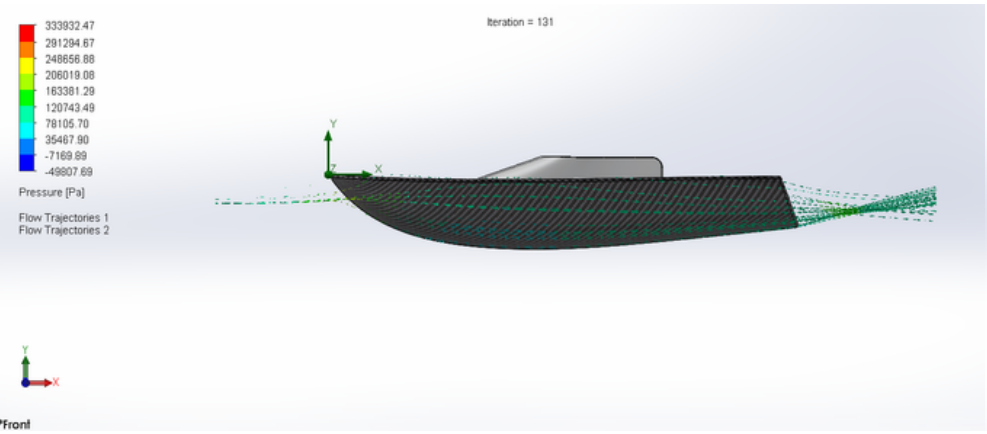
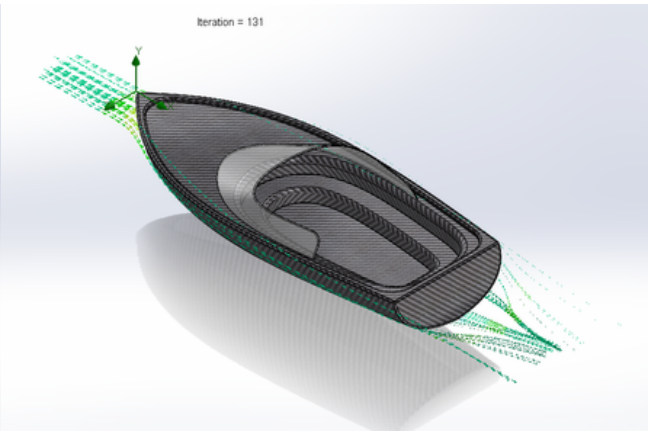
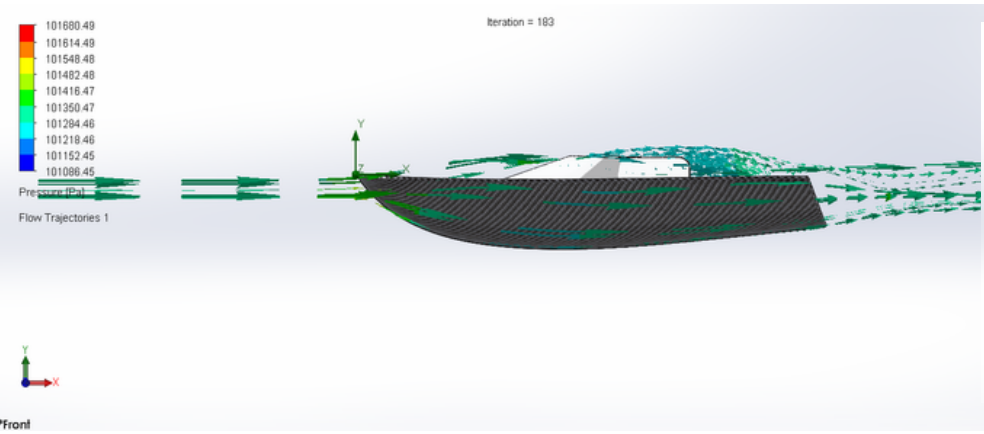
SPEED BOAT MOCK UP - PERSONAL PROJECT

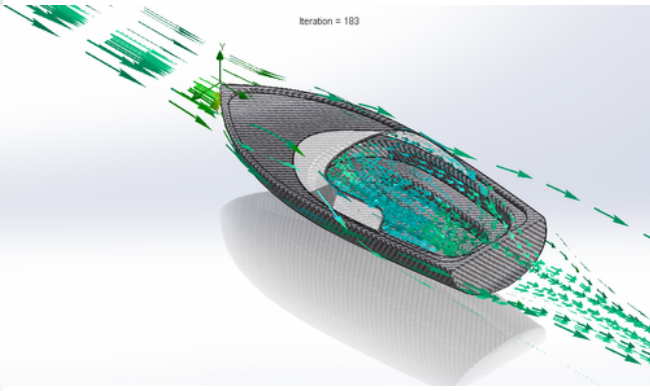






Water Flow





Air Flow

- Practiced using **SolidWorks** by designing a small speed boat and conducting **flow analysis** for both air and water.
- Applied material properties by making the hull out of **carbon fiber** and the windshield out of glass.