

RYAN PHAM

MECHANICAL ENGINEERING AT THE UNIVERSITY OF CALIFORNIA, LOS ANGELES (UCLA)



(657) 271-8252

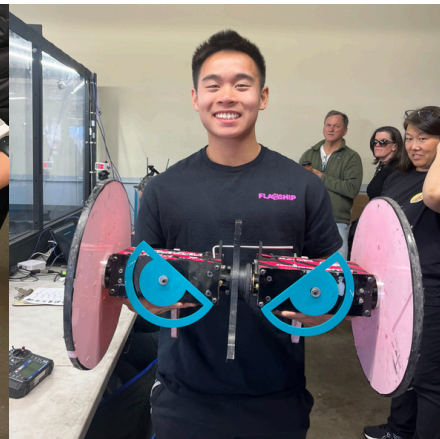
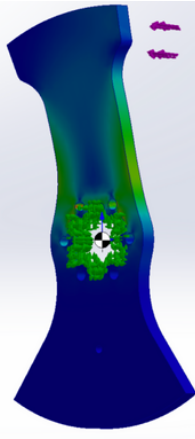
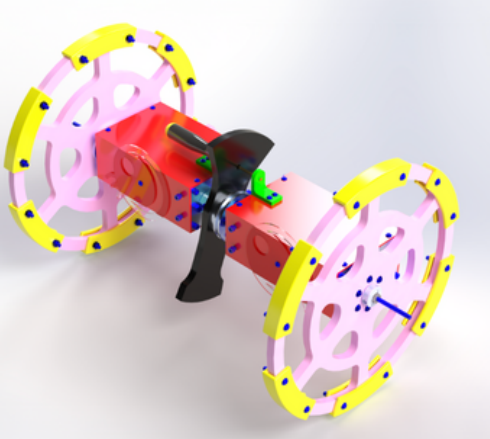


ryanmipham@gmail.com



linkedin.com/in/ryan-pham-go-bruins

"SMALL" – 30LB COMBAT ROBOT | ASME AT UCLA



What?

- Led a team of 7 engineers in the **research, design, and testing of a 30lb combat robot**
- Engineered parts with focus on **manufacturability** and **reliability**
- Directed **project planning**, delegated tasks, managed budget, and set deadlines

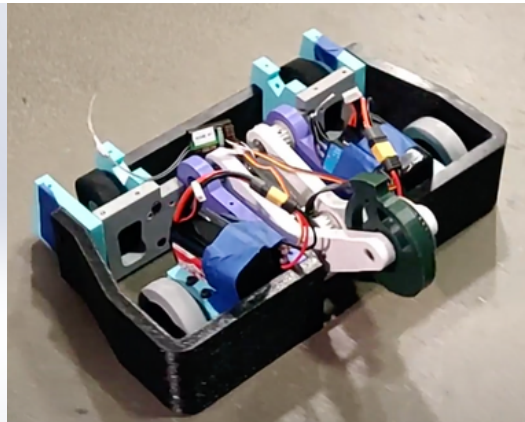
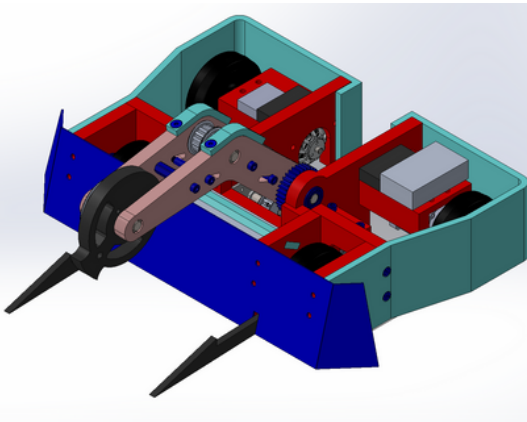
How?

- Designed 11 parts on **SolidWorks**
- Executed **Finite Element Analysis** to study failure modes and avoid stress concentrations
- Used **rapid prototyping** to identify assembly issues early
- Scheduled and assigned tasks to members through **Gantt Chart**

Results

- Presented in **Design Reviews** to gain feedback from alumni and industry engineers
- Competed at SCAR Big Bot Brawl and **placed 5th out of 12 competitors**
- Successfully built and tested robot in 7 weeks

"ORBITAL BOMBARDMENT" – 12LB COMBAT ROBOT | ASME AT UCLA



What?

- **Designed a 12lb combat robot** equipped with a hammer arm and vertical spinner weapon
- **Fabricated and tested** the robot within 3 months

How?

- Applied **design for manufacturing** in CAD
- Prototyped the robot using **3D printed parts** to identify issues
- Utilized **subtractive manufacturing (waterjet, mill, & drill press)** to machine parts

Results

- **Reduced weight by 14%** from 15lb to 12lb for competition
- Competed at **May Metal Massacre 2024**
- **Survived 2 rounds**, but got eliminated after being incapacitated by a wedge bot

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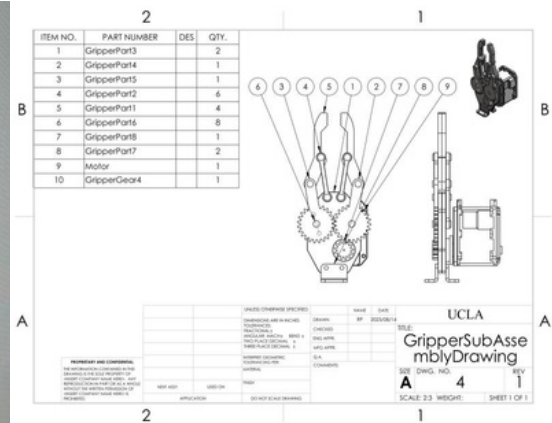
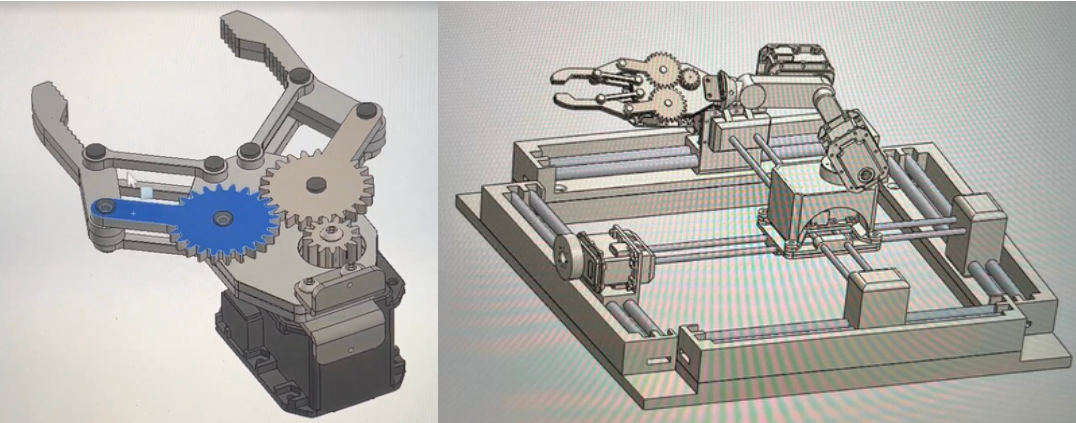


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ROBOTIC MANIPULATOR CAD | UCLA ENGINEERING *UCLA*



What?

- Designed a robotic manipulator with 2 translational (X, Y) and 3 rotational (yaw, pitch, roll) degrees of freedom
- Developed **engineering drawings** for manufacturing

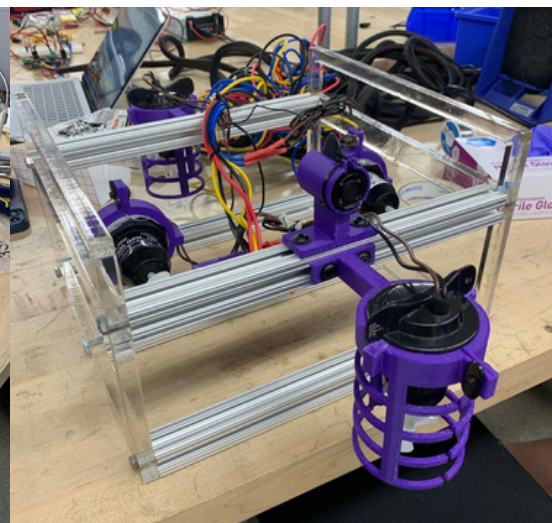
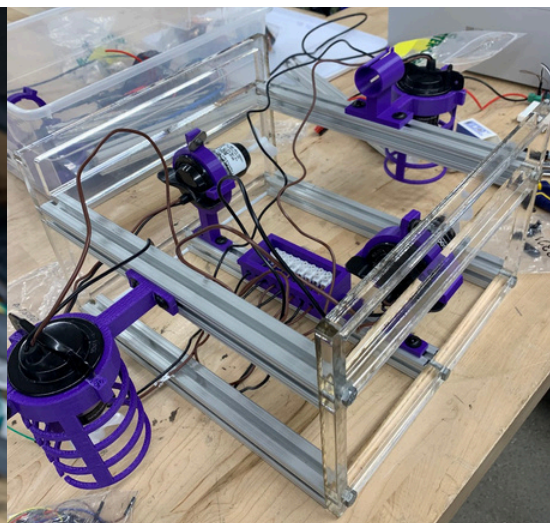
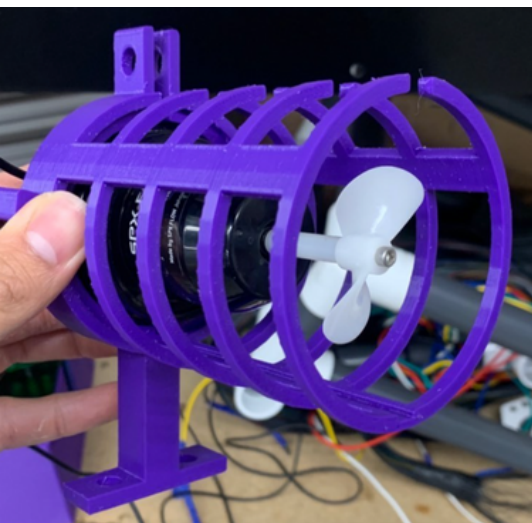
How?

- Utilized **SolidWorks**
- Created **detailed part and assembly drawings**
- Integrated CAD using effective **assembly management**
- Created **3D motion study** to showcase arm's movements

Results

- Total of **28 unique parts and 5 subassemblies**
- Received an **A+** for MAE 94
- Obtained extra credit for **5 degrees of freedom achieved**

UNDERWATER ROBOT | UCLA ENGINEERING *UCLA*



What?

- Created an **underwater robot**
- Designed and fabricated **4 thruster mounts**
- Manufactured **chassis** made out of aluminum T-bars and 1/2" thick acrylic

How?

- Iterated through mount designs with **3D printing and SolidWorks**
- Applied **design for assembly**
- **Laser cut** the 2 acrylic frames
- Used a **miter chop saw** to cut 5 aluminum bars to size

Results

- Completed robot within **10 weeks** in Winter 2024
- **Successfully navigated** through pool obstacle course to test robot functionality
- Got an **A** in Engineering 96

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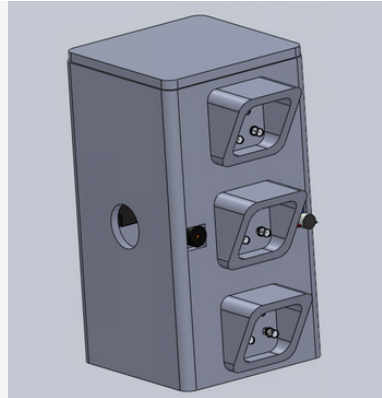
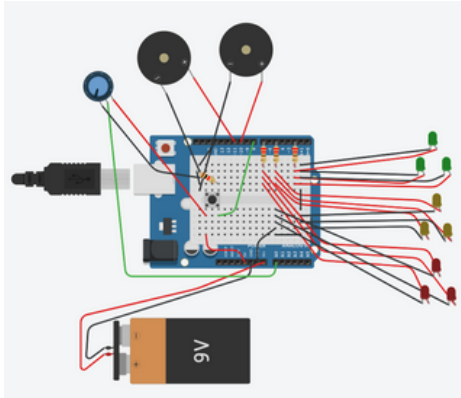


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linkedin.com/in/ryan-pham-go-b Bruins

SOUND MONITOR TRAFFIC LIGHT | ASME AT UCLA



What?

- **Sound monitor shaped like a traffic light**, intended for monitoring noise in classrooms
- Traffic light **changes color based on noise level**, playing an alarm if too noisy

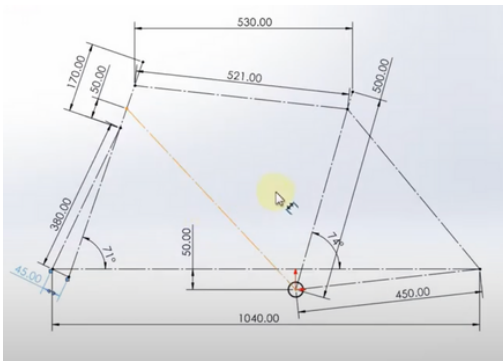
How?

- Leveraged **Arduino circuit** with noise sensors, speaker, and LEDs
- **Wrote C++ script** to monitor noise level and change colors
- **Designed and 3D printed** traffic light housing with SolidWorks

Results

- Finished project in **8 weeks** during Spring 2023
- **Won 2nd place in creative project competition** out of 14 participants
- [A video demo is linked here:](#)

BICYCLE CAD ASSEMBLY | ASME AT UCLA



What?

- Created **assembly of a bicycle with 8 parts** to learn computer-aided design in Fall 2022

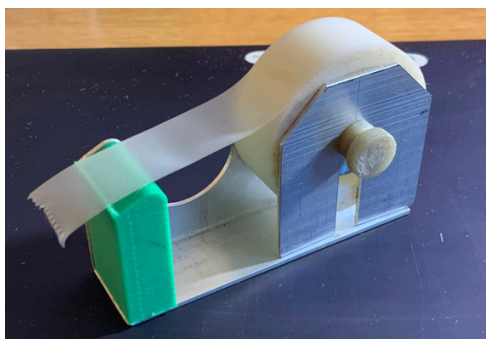
How?

- **Designed** with SolidWorks
- **Researched** design of bicycle frames, forks, and wheels

Results

- Gained proficiency in **SolidWorks features and assembly mates**

ALUMINUM TAPE DISPENSER | ASME AT UCLA



What?

- **Fabricated a functional tape dispenser** using aluminum 6061 scrap and PLA for my college dorm room in Winter 2023

How?

- Programmed **CNC mill via SolidWorks CAM** for the base plate
- Used a **manual mill** to machine the aluminum retention plate
- Utilized a **lathe** for turning and facing the axle to hold the tape
- **3D printed** the green tape cutter

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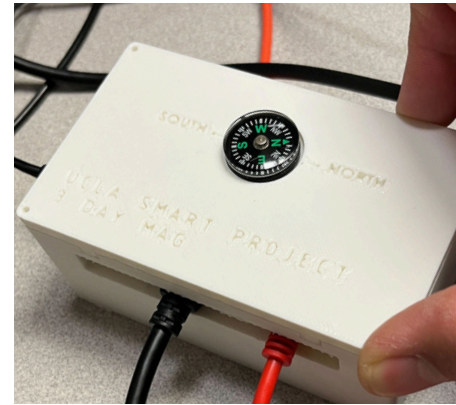
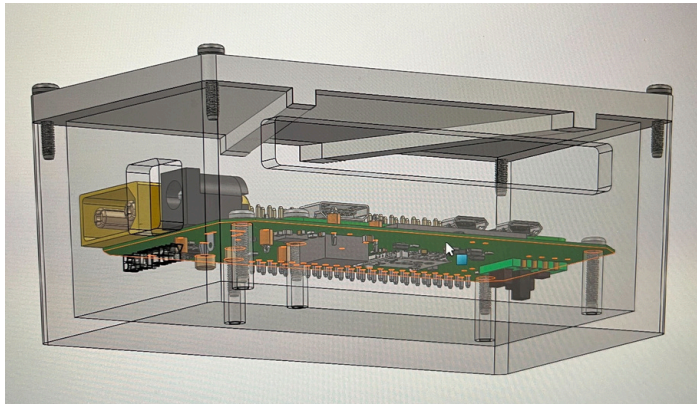


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MINI MAGNETOMETERS | UCLA SMART PROJECT



What?

- Designed an **enclosure for a mini magnetometer** for space weather research
- Easily accessible but sturdy** with minimal assembly steps
- Raspberry Pi needed to be **oriented a certain direction** to properly collect magnetic data

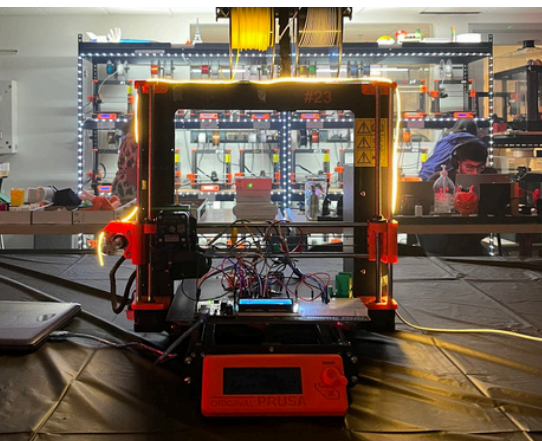
How?

- Leveraged **design for assembly**
- Implemented **diagonal strips on the box lid** so it could only fit in one orientation
- Added a compass slot and text to allow the end user to orient the device correctly
- 3D printed** using ABS

Results

- Assembled **20 mini magnetometers**
- Shipped the devices to 19 high schools across the U.S.
- Collected data on the **Earth's magnetic field** before, during, and after the **solar eclipse on April 8, 2024**

MAKERSPACE ESCAPE ROOM | UCLA MAKERSPACE



What?

- Organized an **escape room** using UCLA Engineering Makerspace equipment
- Themed the escape room puzzles around **defusing an explosive device**
- Collaborated in a team of 3 staff

How?

- Created "bomb" **circuit** that needed to have wires pulled in the right order to be neutralized
- 3D printed** puzzle parts that fit together to spell out a hint
- Developed **Arduino circuit** that needed to be debugged by participants to reveal message

Results

- Hosted escape rooms for a total of **29 participants**
- Received **overwhelmingly positive reviews** based on feedback forms
- Each team succeeded in solving the puzzles in time!