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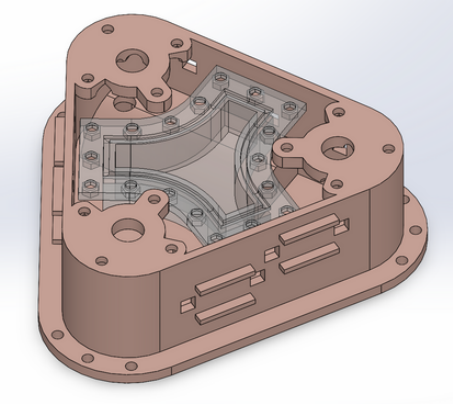
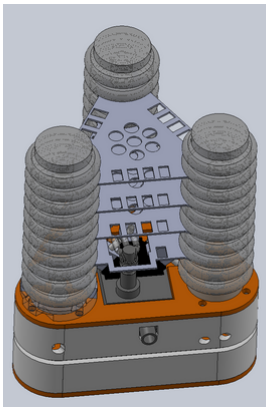
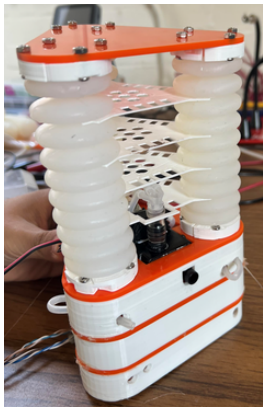
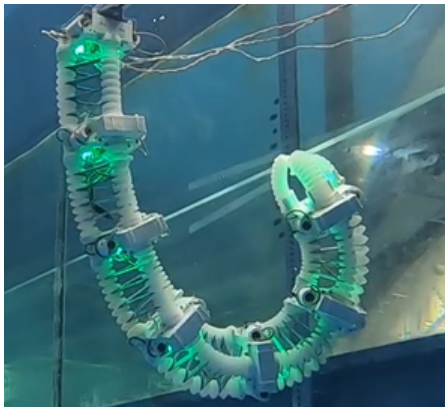
UNDERWATER SOFT ROBOTIC ARM

UIUC INTELLIGENT MOTION LAB





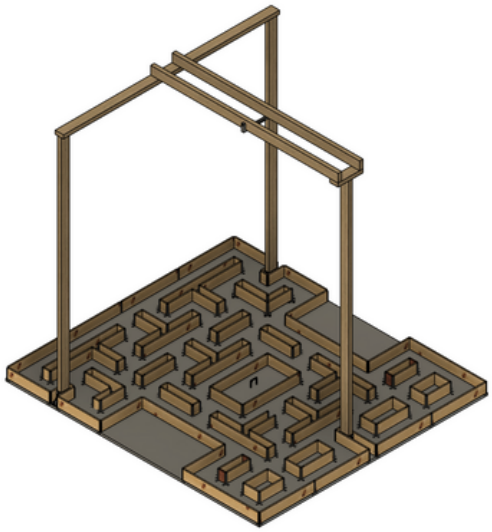




- Modeled and created a modular assembly for a hydraulic soft robotic arm.
- Used concepts from **fluid dynamics** to determine subassembly specifications.
- Used **SOLIDWORKS** to model the assembly with all subcomponents.
- Printed using **SLA** for the electronics casing and hydraulics layer.
- Used **FDM 3D printing** to create chassis.
- Resulted in a repeatable model that was used to create a 6 module long robotic arm.
- Robotic arm could traverse in desired curvy motion without failures.

PACBOT ARENA DESIGN PROJECT LEAD

UIUC IROBOTICS



- Lead a project team to design and create an 8ft by 9ft field for the Harvard PacBots competition.
- Used **modular design** to allow for fast assembly and meet tight storage requirements.
- Created model collaboratively using **Fusion360**
- Made part using **CNC routing**, **laser cutting,** and **FDM 3D printing**.
- Used **GD&T** to allow for repeatability.
- Had a functional arena that was suitable for the competition.
- Provided **open source** access to all competing universities, allowing them to create practice fields.

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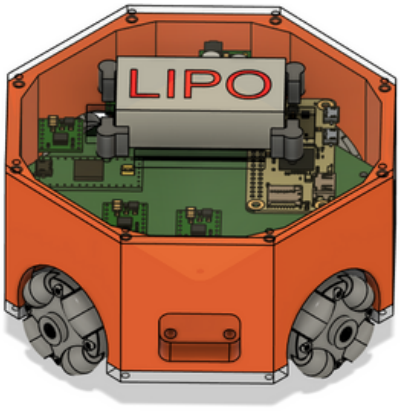
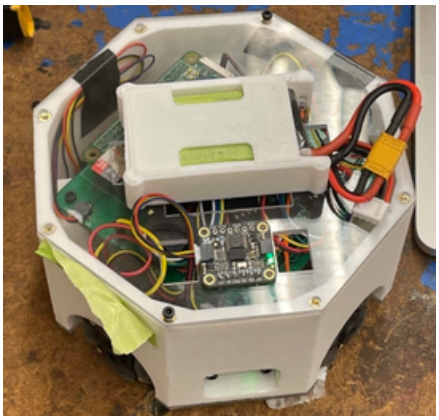
PACBOT ROBOT DESIGN

UIUC IROBOTICS





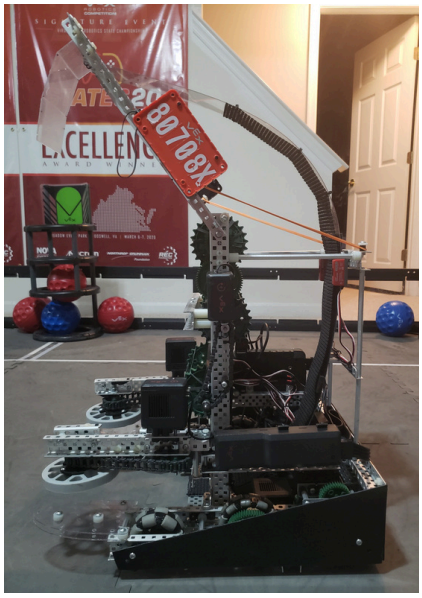
- Designed an **autonomous robot** to compete in a real-life Pac-Man based competition.
- Used the unique approach of a **holonomic drive**, which proved to be optimal for the challenge.

- Designed using **Fusion 360** and applied **GD&T** to allow for prototype repeatability.
- Closely relied on **cost-benefit analysis** due to limited budget.

- Resulted in a robot that was the **first ever** to beat the game.
- Allowed other teams to analyze my design and improve upon on it.
- Continued to win the following year with a **point total 50% higher** than the next highest team.

VRC ROBOT DESIGN AND PROGRAMMING

VEX ROBOTICS



- Worked with a team to create a robot every year to compete in the VEX Robotics Competition.
- Made novel path planning and traversal algorithms using **C++.**

- Created an initial prototype design and continually improved upon it to increase score throughout the year.
- Used **linkage mechanisms** to create various end effectors to meet the competition needs.
- Used various sensors to accurately determine robot position and perform complex maneuvers.

- Competed at various events ranging from local to international.
- Performed at the **Worlds Competition** and made it to **semifinals**.