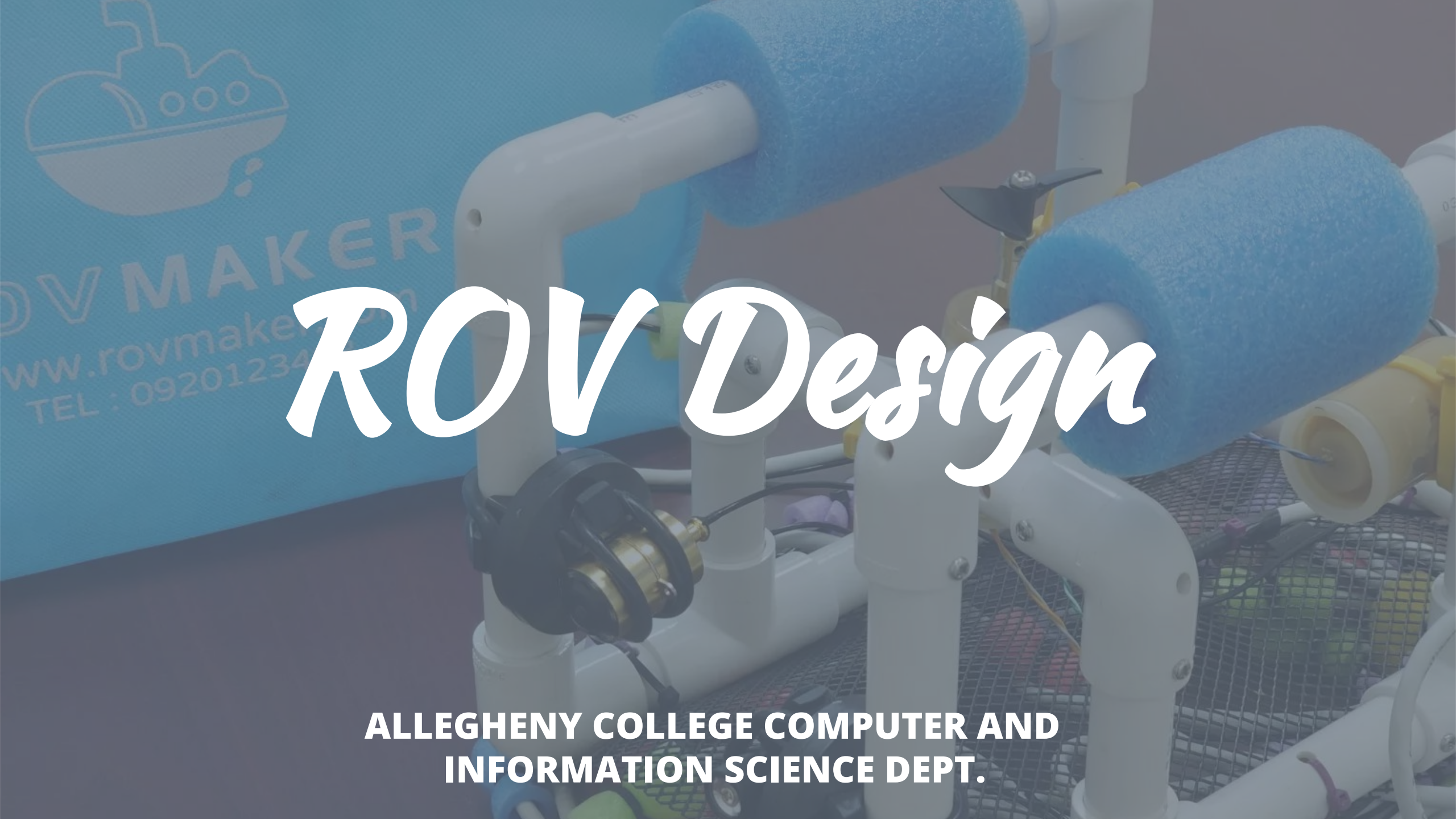


ROV Design

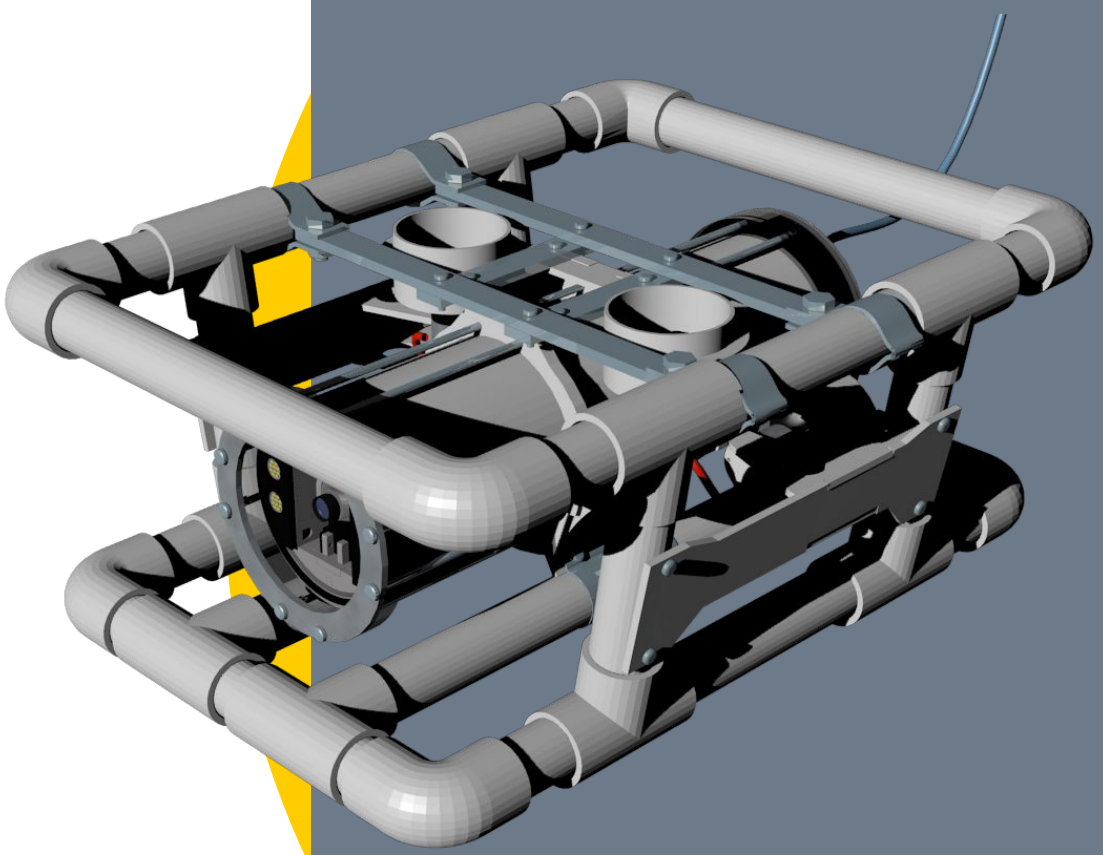
ALLEGHENY COLLEGE COMPUTER AND INFORMATION SCIENCE DEPT.

Today's Agenda

01 What is an ROV?

02 ROV Designs

03 Build Your Own Frame

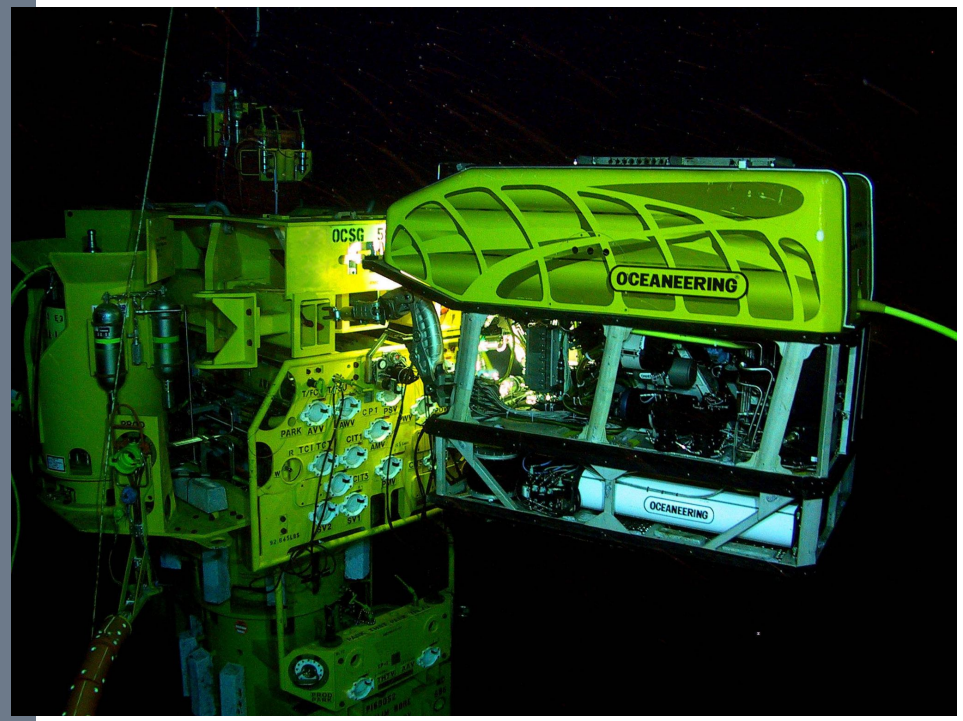


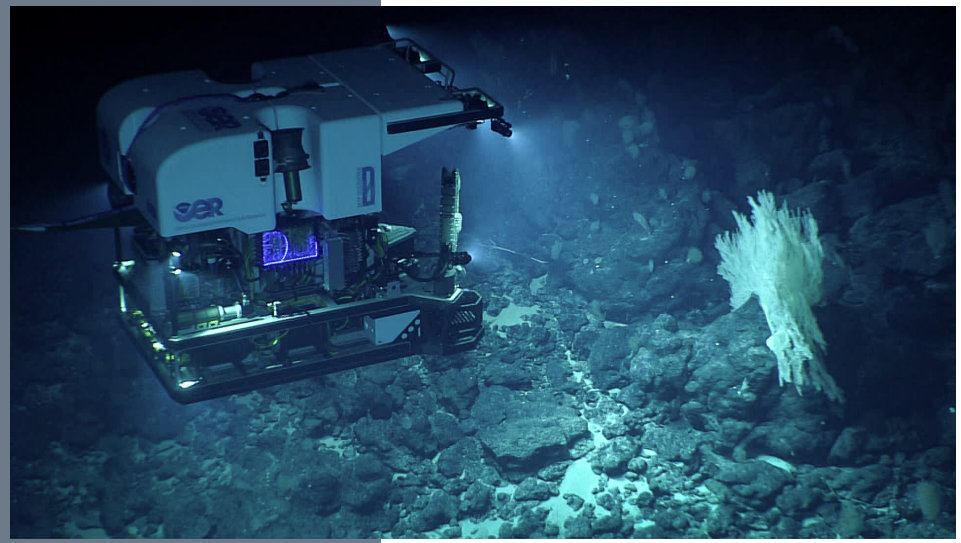
What is an ROV?

- ROV stands for Remotely Operated Vehicle
  - Remote - Pilot is not on the vehicle
  - Operated - Controlled
  - Vehicle - Self-contained
- Tethered ROVs are commonly used for underwater robotics!
  - 1 - We can retrieve the robot if there is a malfunction
  - 2 - We can send and receive signals easily through cables

There are tons of fields Underwater ROVS can be found

- Research
- Underwater archeology
- Search and rescue
- Pipeline inspections
- Construction
- Water Quality Management
- Underwater Surveys
- Student Learning





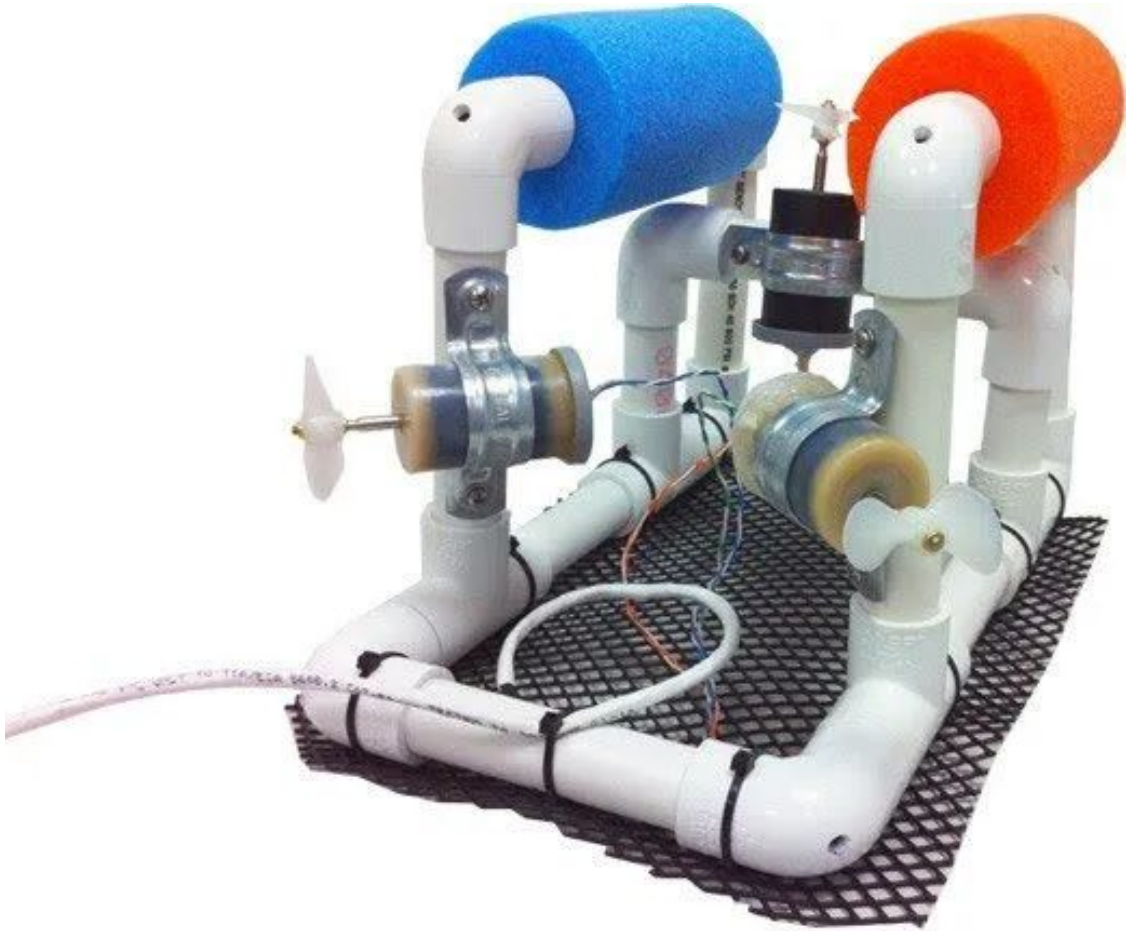
ROV Systems

- Frame
  - Holds it together
- Buoyancy
  - Float or sink
- Propulsion
- Power
- Control
- Tether

- Navigation or Sensors
- Payload
  - Gripper - pick up stuff

Don’t worry about the last two!

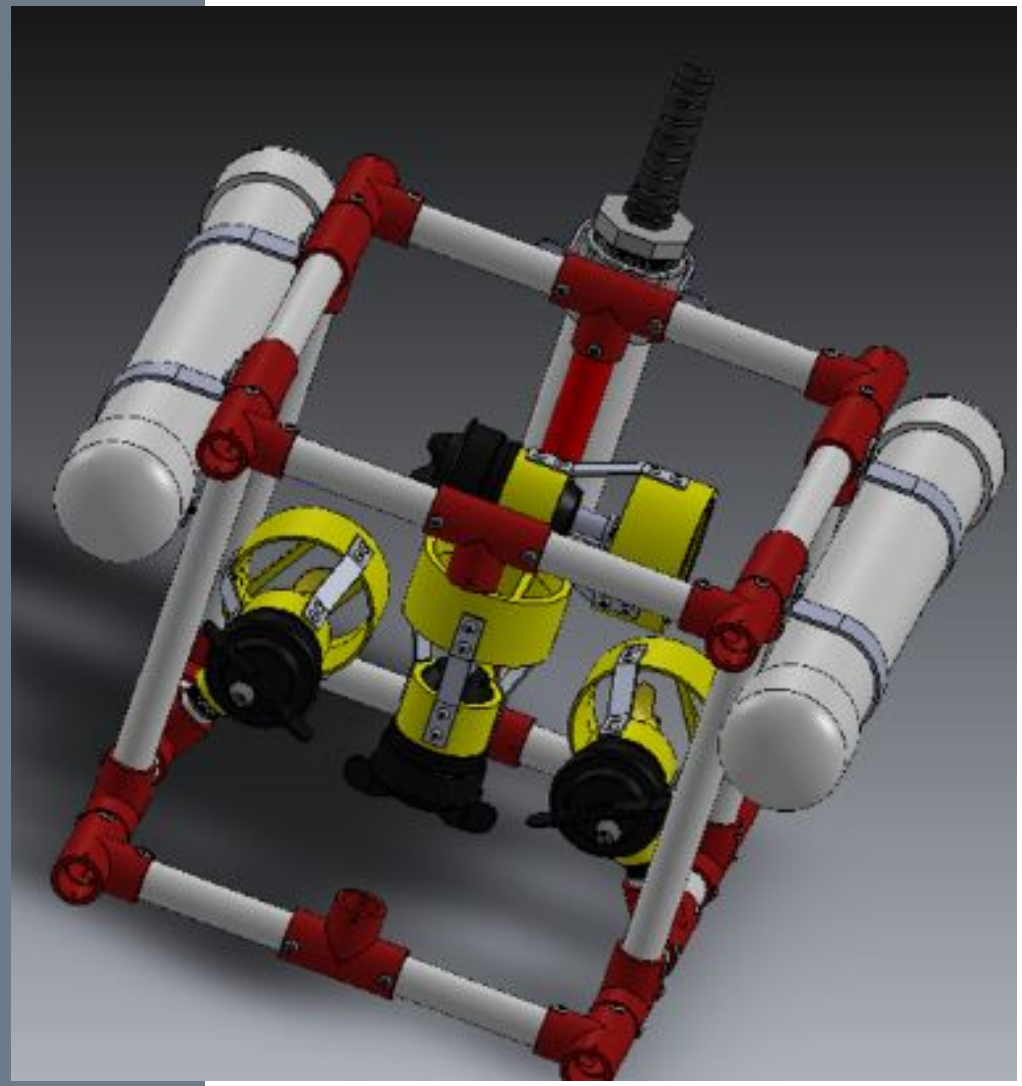
ROV Designs



Materials Used

- PVC Pipe
  - Affordable
  - Durable
  - Easy to build with
- Pool Noodles
  - Easy buoyancy control
- DC Motors with Propellers
  - Can go backwards or forwards
  - Waterproofed
- Tethers
  - Long waterproofed tethers to transmit signals through

Standard 4 motor Orthogonal Design



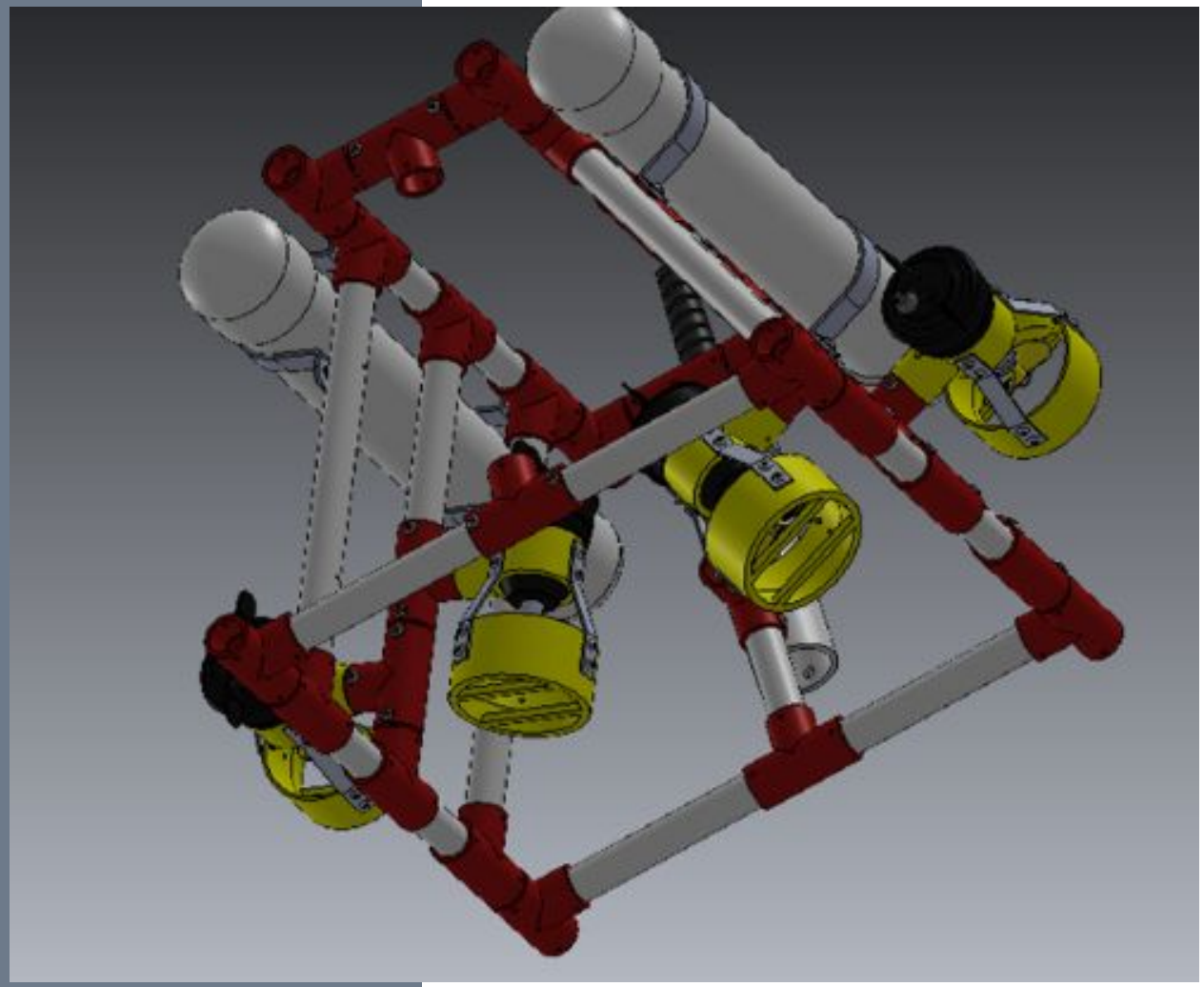
Movement:

- Surge
- Heave
- Yaw
- Sway

Alternative Design - 4 motored Vector design

Movement:

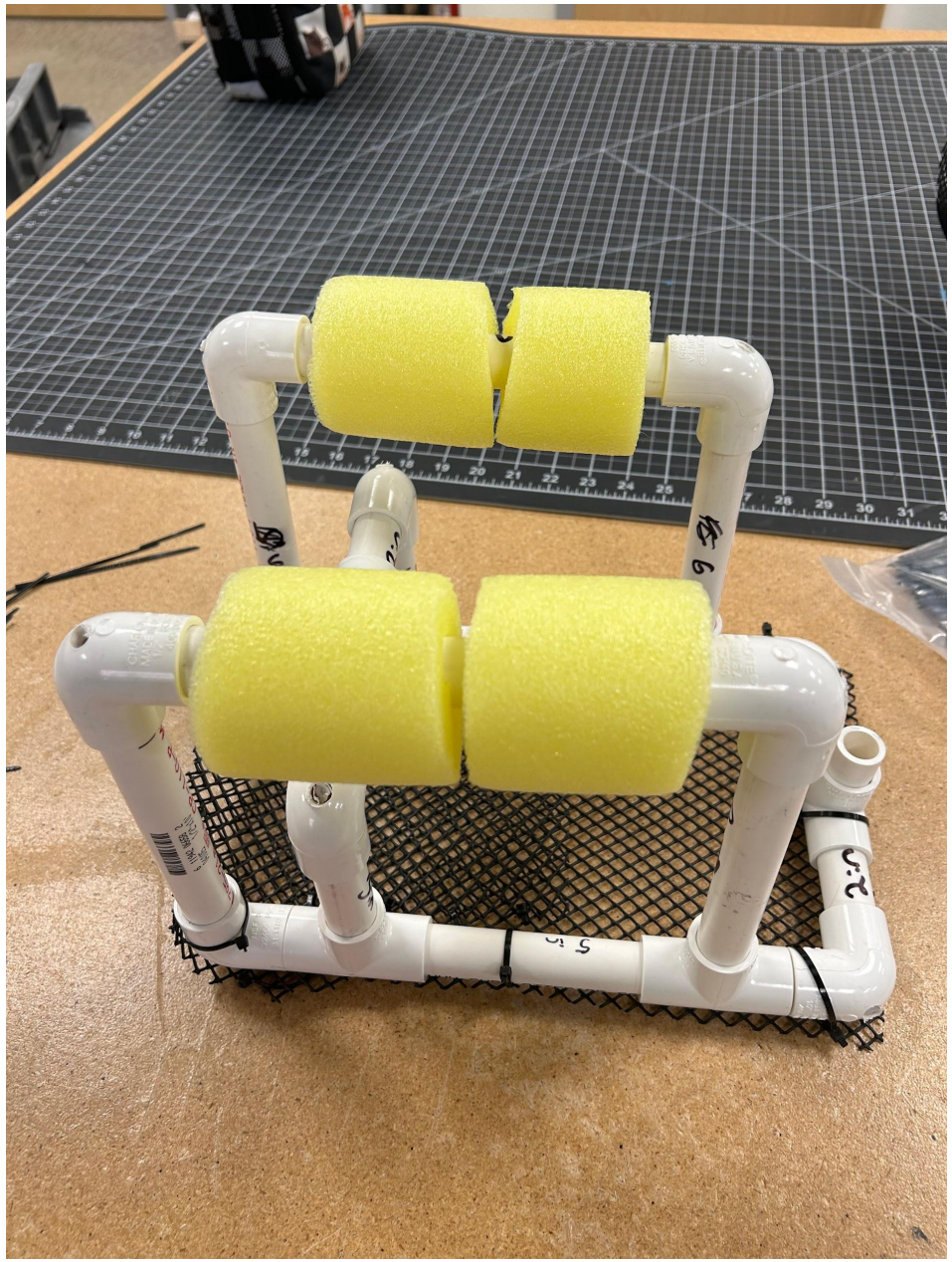
- Surge
- Heave (vectored)
- Yaw
- Sway (vectored)



Build Your Own Frame

We will be making a 2 motor Orthogonal design

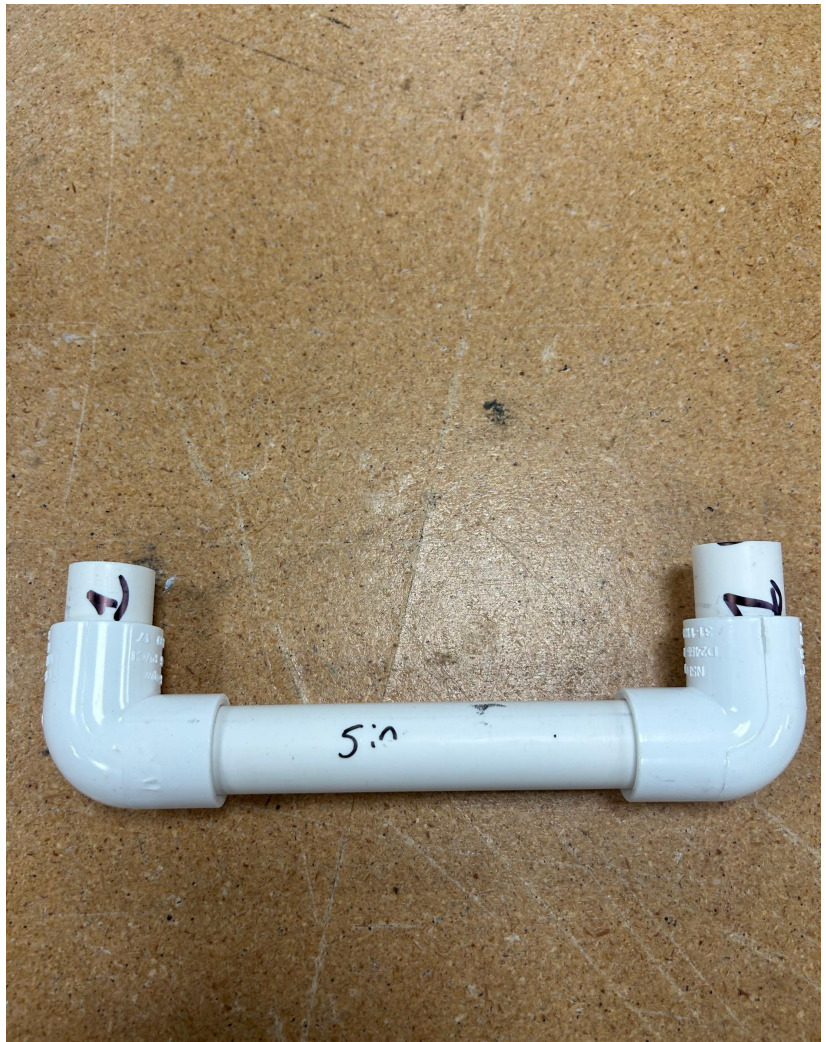
- 1 horizontal motors
  - Forward backwards
- 1 vertical motor
  - Up and down



Large Version Video Tutorial (Ours is a slightly smaller version)

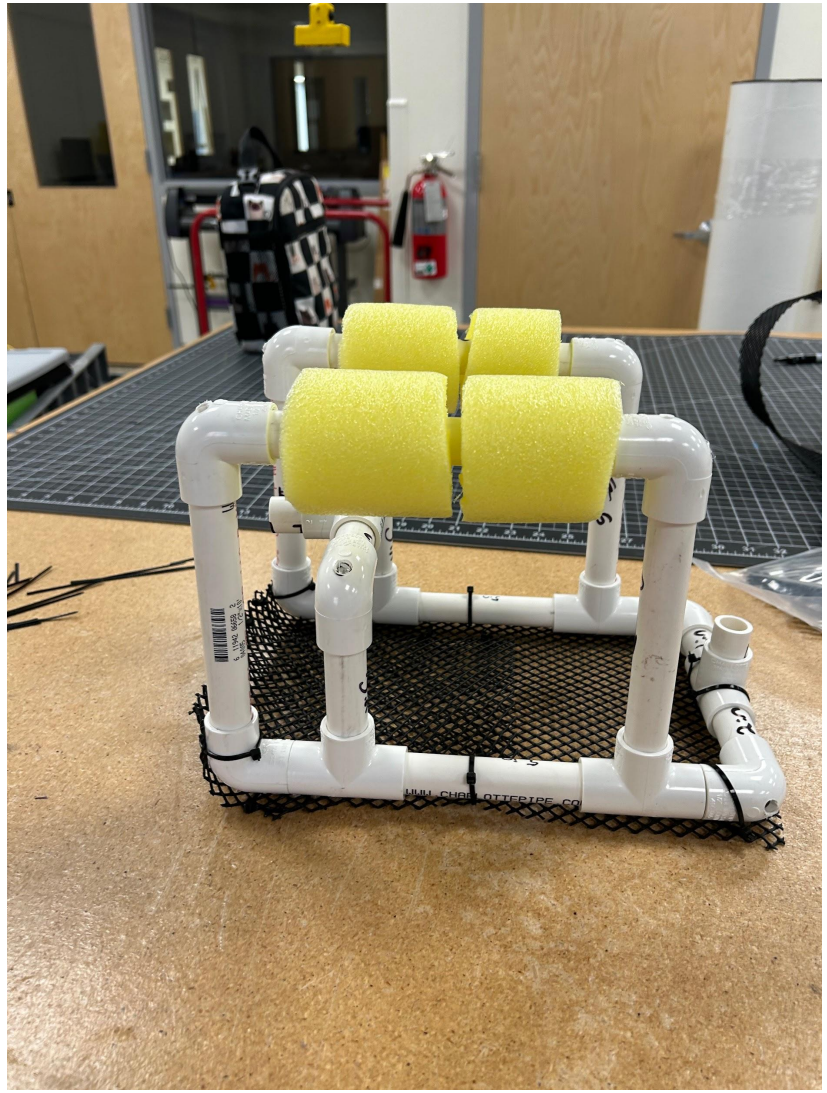
https://www.youtube.com/watch?v=Lnr5YlBl550

Step 1: Gather Materials



- PVC Pipe of Various Sizes
  - 2x 7 in long ½ in PVC Pipe
  - 4x 6 in long ½ in PVC Pipe
  - 2x 5 in long ½ in PVC Pipe
  - 2x 3 in long ½ in PVC Pipe
  - 4x 2 in long ½ PVC Pipe
  - 6x 1 in long ½ in PVC Pipe
  - 10 ½ in PVC Corner piece SxS
  - 6 ½ in PVC T pieces SxSxS
- Zip ties
- Netting

Step 2: Follow the Build Steps



1. Go to https://docs.google.com/document/d/1JO1pM3XBeRCmAP9afXCYYmD5eIm-PML3H3EooP9FBmE/edit?usp=sharing and follow the instructions to build your ROV Frame!

Congratulations on making the frame for your ROV! Next time we will work on the Motor System!