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a robot a day keeps the reef at bay

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Why This Matters

Overview

- Coral reefs:
  - Help us track the progression of climate change.
  - Support 25% of ALL marine species.
  - Protect coastal communities.

Threats to Coral

- Plastic debris
- Changing environmental conditions
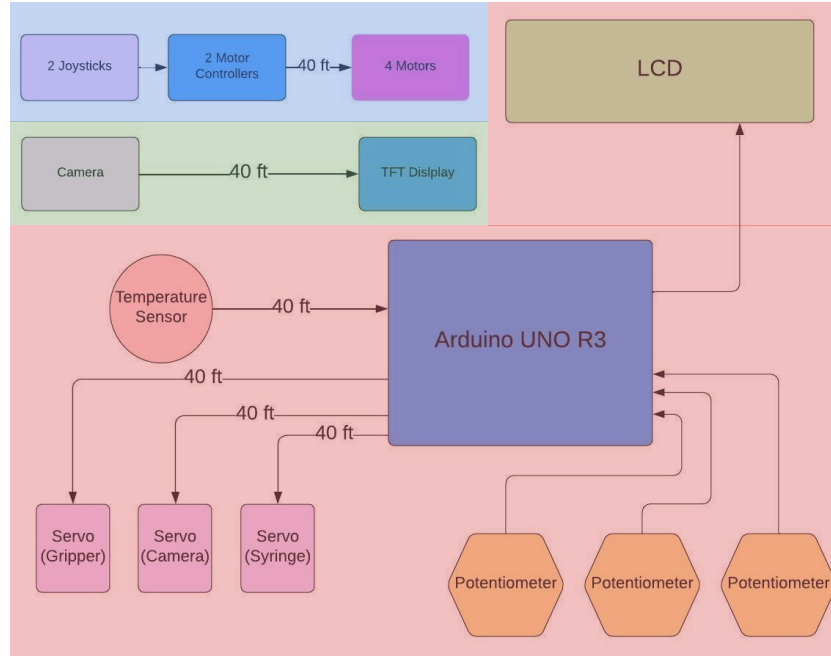- Invasive predatory species
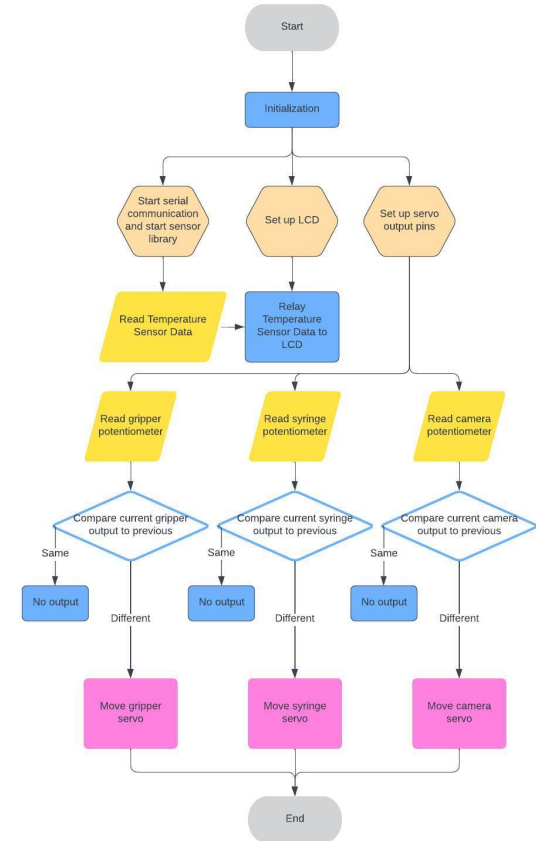

Why an ROV?

- Precision and efficiency
- Easy access to challenging environments
- Reduced human impact
- Scalability
- Cost-effectiveness
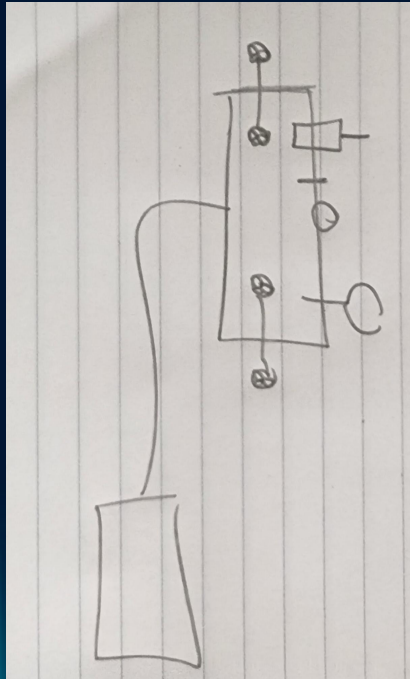- Divers' safety

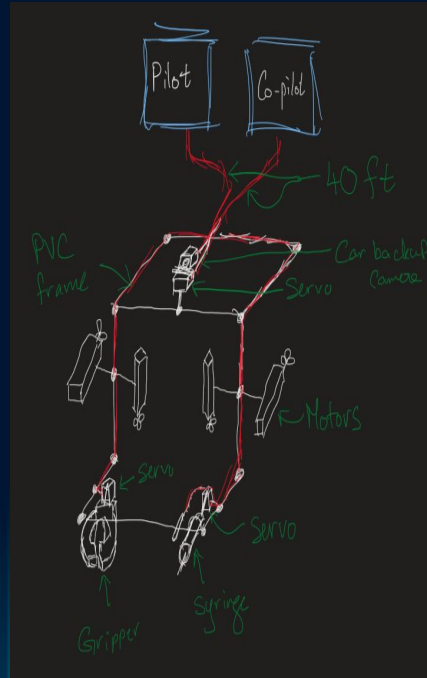# System Flow Diagram
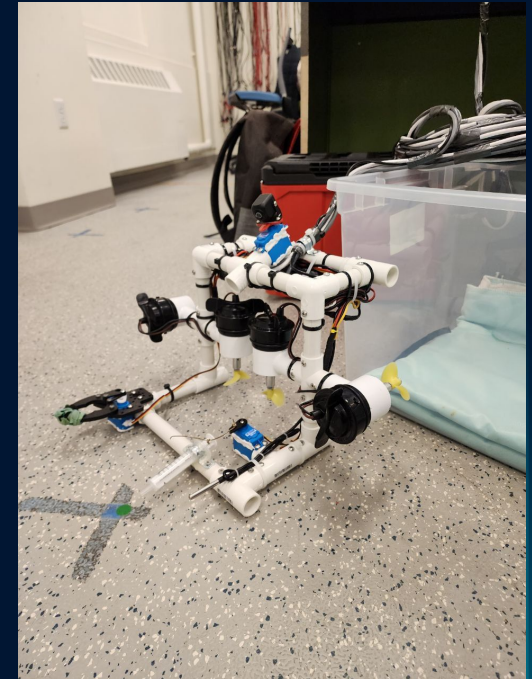

HARDWARE

SOFTWARE

Drawings, Sketches

Our First Sketch

Getting There... (???)

Yay for Improvisation!

Pilot

Co-pilot

40 ft

PVC frame

Car backup Camera

Servo

Motors

Servo

Servo

Syringe

Gripper

UX/UI

Topside Control Unit consists of two controllers for pilot & co-pilot
- Pilot
  - Uses joysticks to control four motors (to actually move the ROV)
  - Monitors live camera feed using display
- Co-Pilot
  - Uses potentiometers to control the two ROV manipulators and adjustable panning camera
  - Monitors incoming temperature sensor data using LCD display

Hardware, Software, Prototyping

Software

- Arduino IDE for code*
- SolidWorks Student Edition for CAD*
- LucidChart for System Flow Diagrams*

All items marked with an asterisk (*) were either free or previously available and hence not purchased.

Hardware

- Arduino UNO R3* ($27.60)
- PVC Chassis ($12.00)
- Syringe ($0.71)
- Gripper Kit ($9.99)
- Pixelman Backup Camera ($19.99)
- Waterproof Temperature Sensor ($9.95)
- 4 Waterproof Bilge Pump Motors* ($180.00)
- 2 Sabertooth Motor Controllers* ($119.98)
- 3 Waterproof Servos* ($89.97)
- 4 Potentiometers* ($3.40)
- LCD* ($7.00)
- 2 Joysticks ($19.98)
- Tethers ($21.22)

Prototyping

- Soldering Iron* ($30.00)
- Power Drill* ($29.00)
- Hole Saw* ($24.98)
- 18 Straight Hours of Blood, Sweat, and Tears in Adi's Basement ($priceless.99)

Final Costs

Software	$0.00
Hardware	$521.79
Prototyping	$83.98
Tools/Parts previously available	$511.93
Total	$93.84