

DIY PVC-Frame ROV — Goal & Overview

Project Goal:

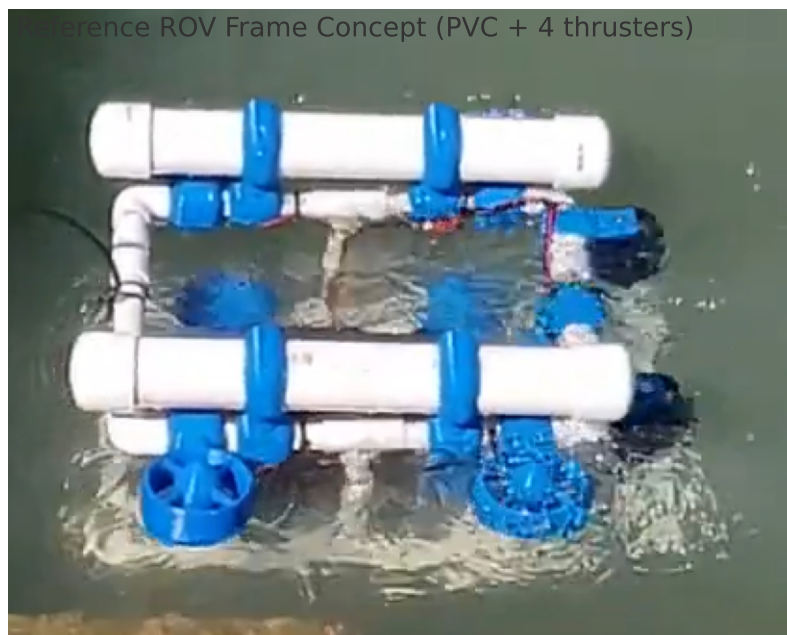
- To design and develop a cost-effective, small-scale Remotely Operated Vehicle (ROV) capable of underwater exploration in pools, lakes, or shallow coastal environments.

Purpose:

- Provide hands-on experience in marine robotics, control systems, and waterproofing methods.
- Serve as an educational and research platform for students, hobbyists, and innovators.
- Enable testing of sensors and underwater instruments in real conditions.

Key Features:

- Modular PVC frame for quick assembly and easy modifications.
- Four-thruster arrangement allowing 3D maneuverability: forward/reverse, turning, diving, and ascending.
- Neutral buoyancy and stable operation achieved with floats and ballast.
- Tethered communication for reliable control and power delivery.
- Expandable design with options for cameras, lights, and basic underwater sensors.



Abilities & Expected Achievements

ROV Abilities:

- Multi-directional Movement: Forward, reverse, yaw rotation, vertical ascent/descent.
- Underwater Surveillance: Equipped with optional camera and lights for visual inspection.
- Research Tool: Integration of sensors (temperature, turbidity, IMU, depth) for water studies.
- Robust & Modular: Easy to adapt for different experiments or payloads.

Expected Achievements:

- Demonstration of practical underwater robotics concepts including buoyancy control, thrust balancing, and tethered communication.
- Development of a low-cost, scalable marine robotics platform that can be reproduced for educational use.
- Hands-on exposure to electronics integration, waterproofing, and control system programming.
- Capability to monitor aquatic environments, inspect underwater structures, or test prototypes in controlled water bodies.
- Potential to expand into advanced marine robotics applications such as autonomous navigation and environmental monitoring.