

# Review of: "Design and Fabrication of a Low-Cost Multi-Purpose Underwater Remotely Operated Vehicle"

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Potential competing interests: No potential competing interests to declare.

## Introduction:

1. "However compared to humanoid ... autonomous manipulation":

**Comment:** Too much unnecessary background information

2. "Although these techniques are useful, their cost is higher. Therefore, for this project, the tethered connection is chosen over wireless."

**Comment:** So low cost is the only motivation or is it that tethered connection solves a lot of other problems such as signal delay, communication loss, etc.?

3. "These vehicles can be used to find silt, cracks, corrosion, and defects because these facilities are old and need routine maintenance"

**Comment:** How long a tether are you planning on using? What's the operating range?

4. "Precious jewels" **Comment:** You mean treasures in general?

5. **General Comment :** Good low-cost wireless underwater vehicles (ROVs) have been developed decades ago. Please see the following and consider thinking about your unique contribution:

<https://theworld.org/stories/2015-02-09/how-undocumented-high-schoolers-arizona-beat-mit-nations-top-robotics-competition>

[https://www.youtube.com/watch?v=jROD7GRqKDk&ab\\_channel=FOX10Phoenix](https://www.youtube.com/watch?v=jROD7GRqKDk&ab_channel=FOX10Phoenix)

What is your improvement / advantage over others?

## Statement of purpose:

1. "For operations involving ... precious jewels" - Repeated sentence
2. "Human-free underwater driving while surfing" - How is underwater driving possible while surfing?
3. **General comment** - sounds very repetitive

## Modularity:

- "The vehicle's speed decreased as a result of higher drag caused by adding more sensor payload. This has little effect on runtime and top speed for a slower non-cruising vehicle."

**Comment:** Repeated sentences

## Mechanical Design:

1. "taken into **mind**" -

**Comment:** (mind: account / consideration)

2. "Price of the **car** down"

**Comment:** (ROV instead of car)

3. "At the moment, useful objects can only be manually caught."

**Comment:** Define useful objects? Spoon, knives, phones or treasure chests, artifacts, fish, etc.?

4. "roughly optimal"

**Comment:** What is considered as "roughly"?

5. "anti-collision airbags"

**Comment:** What do you need airbags for when exploring underwater?

6. "There were three vectored waterjet thrusters in its propulsion system."

**Comment:** So I am assuming the vehicle can turn, go up and down, and forward. That should make it a 3DOF vehicle, right? This is not what you've written in the conclusion.

7. Last sentence (In order to create ...**some** researchers)

**Comment:** When citing papers, terms like some researches should be avoided. You may say the name of the first author such as Wynn, R. B., et al.

## Drag Force:

- "Thrust force is calculated, it is the propeller thrust,  $T$  is the thrust coefficient,  $K_T$  a is the propeller disk diameter and  $\Omega$  is the propeller shaft speed."

**Comment:** You have 3 propellers to the best of my understanding. How is equation 6 taken into consideration for your work?

## Sealing and Waterproofing:

- "The maximum calculated collapse pressure comes out to be 117 psi at 50 m"

**Comment:** Can you manually operate your vehicle with a tether at depths of 50 m?

## Electrical System (GPS):

- **Comment:** Should provide reference to where you got this information from. GPS is a pretty standard localization tool, so may not need so much information if a reference is provided.

## Electrical System (Light Source):

- "We came to the conclusion that employing green light in parallel to regular lights with a range of about 10 meters would attract marine creatures and increase the likelihood that we would be able to capture them after studying the psychology of fish and other sea creatures"

**Comment:** Your goal changed here? Is your objective now is to capture marine creatures to study them?

**Electrical System (Power Consumption and source):**

- **Comment:** If you are already using a tether for controlling or communicating with the vehicle, why not supply power from land how much every you want? That can reduce the chances for any battery related hazard.

**Electrical System (Robotic Arm):**

- “In our project, we developed a manipulator arm with the ability to grab, collect, and hold a variety of things or be used for clamping.”

**Comment:** Why not add more information about this?

**Conclusion:**

- “The vehicle’s architecture only allows for 2 DOF translation motion”

**Comment:** I am assuming they are (1) up-down, and (2) forward backward. What about sideways? What is the total DOF including rotational? Three / six?

**Overall Comment:**

Overall the work might be good, but it is not brought up in the paper. The paper writing quality is poor and there are several inconsistencies. Please consider revising.