RECOVER-V (Remotely Controlled Observer Vehicle) as Aquatic Ecosystems Monitoring Device

Akbar, Zaki (School: SMAN 3 Malang)
Masantika, Atya (School: SMAN 3 Malang)

A variety of exploratory methods have been utilized, with one of the goals to regulate and maintain the aquatic ecosystems such as coral reefs and fish populations through monitoring. Up to now conventional monitoring methods such as snorkeling to diving have been widely used. Currently, the observation class of remotely operated vehicle (ROV) is used as a more recent monitoring method. However, drawbacks of using a ROV including its shape, low speed of maneuvering, and the expensive cost. Therefore the "RECOVER-V (Remotely Controlled Observer Vehicle)," a torpedo-shaped ROV design that functions as an underwater monitoring device is developed. The design processes begin with observing, designing, simulating, building, testing, and evaluating the RECOVER-V functionalities. Two main parts of the design are the body and the control section. Arduino microcontroller is used together with a water pressure sensor to detect the device's depth, while the servo and brushless DC motor to control its movement. According to the results of numerical simulations, the drag coefficient of the prototype is 0.44, which is 50% lower than that of the other ROVs and the compartments can withstand up to depth of 90 meters. The result of performance tests revealed the ROV is able to travel at a speed of 0.5 m/s and rotate at a speed of 0.61 rad/s which is higher than the previous prototypes. Having this prototype's good maneuverability and slim body, the process of monitoring the aquatic ecosystems such as coral reefs and fish populations can be carried out more effectively.

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