

Research and Development of a Autonomous Underwater Vehicle

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Abstract

Unmanned underwater vehicles have the potential to add value to our country by increasing automation in our country's aquatic products scientific studies and aquaculture sector, as well as by playing a role in the National Defense Industry. This study presents the design principles of an unmanned underwater vehicle prototype and system intended to perform underwater tasks autonomously. This fully autonomous vehicle will be capable of moving independently or according to predefined commands within a specific area and performing desired tasks. Image processing and autonomous decision-making mechanisms are planned to be developed using artificial intelligence algorithms and embedded Python codes on Raspberry Pi 5. Upon completion of the prototype, the goal is to process live images captured using Raspberry Pi Camera V2 and transfer the decision outputs to the Raspberry Pi 5 controller. Furthermore, the prototype is expected to enable the processing of sensor data such as motor control, direction determination, depth, and temperature on the Raspberry Pi 5. The vehicle's three-axis movement capability is designed to be provided by the Pixhawk Px4 controller, preferred as the motor driver, and 6 motors.

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