Amphibious Vehicle for Collecting Water Samples

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Efficient collection of water samples is essential for scientists. However, most of the existing methods for collecting water samples have many drawbacks, such as being costly or time consuming. Therefore, this device was planned to achieve both aquatic navigability and scientific accuracy in collecting water samples.The project began with the design on AutoCAD and construction of the vehicle structure and wheels. Next, a water collection system was developed to collect, store, and release the water samples. Afterwards, hardwares were chosen and programming for the device was completed. Before testing, several force analyzation diagrams were drawn and formulas were used for calculations to find the water level that will exceed the wheels. Then, foam board was added under the vehicle to lift the vehicle under water. Finally, the vehicle was recorded and tested in calm water, which also led to modifications to the vehicle.Testing shows that the vehicle is able to be remote controlled on land and on calm water. It can carry water samples of up to 50ml. The vehicle achieved a speed of 0.5 meters per second on land. It can reach a consistent speed of 0.2 meters per second on calm water with or without samples. The results indicate that the vehicle is able to overcome the drawbacks of existing methods in calm water conditions, which helps scientists to collect water samples more efficiently. The vehicle designed and created in this project can be reconfigured for other applications, such as video recording.

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