Automated Water Analysis: A Water Drone Developed with Microcontrollers

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Contaminated water is responsible for causing millions of deaths and various effects in people's health worldwide. Many countries spend billions of dollars to fix this problem. Therefore, the main purpose of this work was to develop a drone capable of performing water analysis autonomously in static fluids. The prototype was made to be economically viable and possible to be expanded to public access. The prototype was conceptualized to be a water drone that performs automated water analysis and that is controlled remotely through a Web Server programmed in HTML. This Server also showcases and stores the collected data and can be accessed through any mobile devices. To build the prototype a printed circuit board was made and the microcontroller was programmed to perform the transmission and collection of data and control the aquarium pumps that are responsible for the drone's movement. Finally, the structure of the prototype was built with a Styrofoam sphere, with two layers of MDF board. The first layer allocates the mechanical part and the second layer, the electronic part. The drone was built as planned. The prototype performed well in the field analysis, being able to execute remote water analysis with pH and temperature sensors. In addition, the data collection and transmission were successful and the prototype's locomotion system worked as expected. At the end, the final cost of production of the prototype proved to be totally feasible. With the obtained results, it was concluded that the development of a drone that performs water analysis autonomously in static fluids was possible and financially viable, fulfilling the initial proposal of the project. Lastly, this work has the potential to solve a social issue and meet one of the key engineering conditions.

Awards Won:

Third Award of $1,000