Water Pollution Detection Using Autonomous Drone Hardware and Software
2021-2022

Project Collaborators
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Project Summary

Drone development has been on the rise since the turn of the century and has expanded greatly from government use. Most high quality drones tend to be expensive and have a limited feature set. For this reason, our research aims at creating an autonomous drone capable of water pollution detection, specifically macroplastics, oil and nitrate pollution in order to combat the issues that we see close to home in the Ohio River and Barren River Lake.

The drone was designed to be capable of holding a high quality infrared and RGB camera from Edmund Optics and having a range far enough to be applicable for everyday use and detection. Along with that we made sure to make the drone itself capable of many features using an open source flight computer in order to make the drone powerful and applicable to a variety of sectors. Once the CAD Model of the Drone was completed, we designed a mobile interface in which all aspects of the drone could be controlled from. Along with the water pollution detection, we expanded the mobile interface to include autonomous flight, video streaming, and VR Control in order to increase the applicability of this drone to various different sectors along with the one that we intended.

Once the mobile interface was completed, we tested and saw that the drone paired with the mobile interface accomplished all of the initial goals that we had set out to complete thus showing the applicability of drones to environmental issues.

Project Videos
https://youtu.be/dDu1TFKswCE

Source Code
Source Code Not Available since this is an Industry Sponsored Project

Awards and Recogntions
- 1st Place at the Louisville Regional Science and Engineering Fair in the Embedded Systems Category
- Kentucky Society of Proffesional Engineers Award at the Louisville Regional Science and Engineering Fair
- FirstBuild Scholarship Award at the Louisville Regional Science and Engineering Fair

- Best of Fair Special Award at the Louisville Regional Science and Engineering Fair
- 1st Place at the Kentucky Science and Engineering Fair in the Embedded Systems Cateogry
- Poster Presentation Session Winner at the Western Kentucky University Sutdent Research Conference
- Outstanding Poster and Presentation at the KY National Science Foundation EPSCoR Research Showcase
- 2nd Place Grand Award at the Regeneron International Science and Engineering Fair in the Embedded Systems Category
- Presented at the National Corsortium for Secondary STEM Schools representing Top STEM Students from STEM Schools across the United States

For additional project details please use the contact form or check out the ISEF Project Board.