

Design of a Human Assisted Robotic Platform for Automated Sampling Water flea Populations in Nearshore Regions



NORTHERN ILLINOIS UNIVERSITY

College of Engineering and Engineering Technology

Leonardo Lopez, Dakota Rivard

Advisor: Dr. Sachit Butail

Electrical Engineering, Mechanical Engineering

Abstract

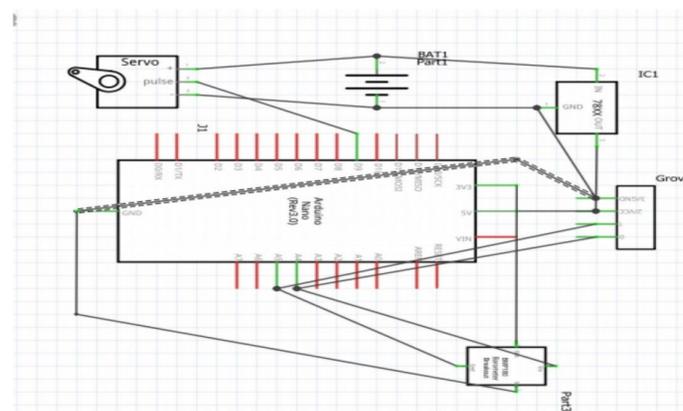
The Great Lakes have spiny water fleas that have a huge impact on aquatic due to their rapid reproduction rates. causing a significant shift in the local food web A critical step in controlling the spread is to monitor them frequently across large areas. Automation of any steps in the collection process will The project will focus on automating the collection process while preserving the samples from contamination.

Objective

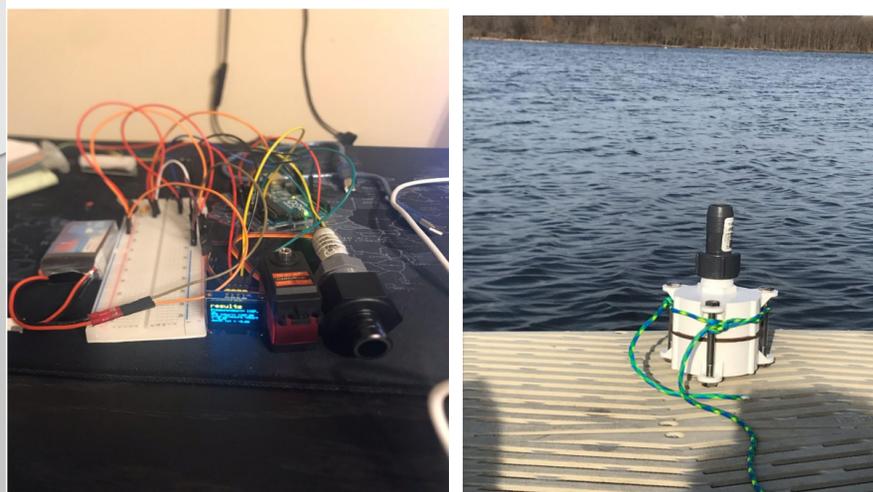
The desired result of the project would be to have made significant improvement to the design provided to us. The more autonomous we can make this process the closer we can get to this goal. The Water Flea Sampling Device will allow for up to six samples to be collected before needing to go back to land. The initial design lacked any electronic elements and will be a prime focus of the design additions. The additions will allow the detection of the devices depth and communicating that to a servo motor and the user. The initial device also did not contain much for the water sealing of the device and as such is another prime objective of this work

Methods and Materials

the electronic design consists of; a micro controller (Arduino nano every), a barometric pressure sensor (MS5803-14BA), servo motor (30KG, continuous), an OLED screen (0.96 inch oled i2c display), A lipo battery (7.4 V, 1000 mAh), and a 5 volt regulator. figure below shows a simple wiring schematic of all these devices



Results



Discussion

Waterproofing is a main focus on the project. The main components of accomplishing this are; epoxy, epoxy putty, flex seal, and a gasket

Conclusions

There is still a lot more to design for the full automation of multiple samples of spiny water fleas but a contribution has been made here. The electronic circuit needed will bring clarity on specific parts needed and the dimensions needed to fit for further progress. The waterproofing of the electronics will bring peace of mind when considering building a larger structure around this.

Acknowledgements

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