MONASH
ENGINEERING

MONASH University

Faculty of Engineering
Summer Research Program 2022-2023

Project Title: Low-cost, in-stream storm event auto-sampler

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Objective

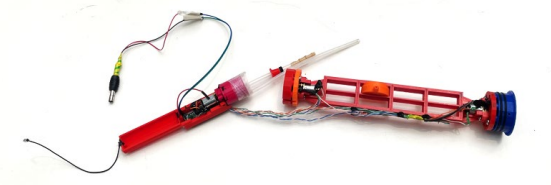
Sampling water from the natural waterways plays important role in understand and manage the sediment, nutrient, and contaminant concentrations, hence help improve the aquatic environments. To make the monitoring and management of natural waterways more effective, water sampling should be done in substantial temporal and spatial scales. However, the commonly used automatic samplers have various disadvantages in large scale sampling (such as, too expensive, complicated, and large, limited power access etc.) Therefore, we have been developing an innovative and low-cost auto-sampler (named MAD-AS Discrete) which is free of such problems but still has the core functions of industrial auto-sampler.

Project Details

The Discrete MAD-AS uses 3D-printed parts and an Arduino-operated micro-control system. Similar to his younger brother MAD-AS, MAD-AS Discrete can collect water sample in small volumes and high frequency. Also, the sample taken can be stored in separated storage spaces, based on the pre-programmed sampling time. The sampler can be deployed in natural waterways for a flexible duration, depending on the focus of research (such as sampling after a storm event). After retrieval, the collected sample will be processed and analysed by Monash EPHM Lab or external lab services. Ongoing and wide-spread natural waterways sampling will provide valuable information on the changes in sediment, nutrient, and contaminant concentrations in different weather conditions and storm events.

Student(s) have the opportunity to be involved in different processes of the development of Discrete MAD-AS auto-sampler, such as the design validation and improvement, device construction and calibration, field deployment, lab analysis and interpretation.

Prerequisites



Basic programming skills (e.g. MATLAB and Arduino etc.)

Additional Information

Students who work on this project may be involved in both lab work and field work.