GATORBYTE – AN OPEN-SOURCE PLATFORM FOR LOW COST, REAL-TIME WATER RESOURCE MONITORING

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Commercially available mobile, water quality monitoring systems are often cost prohibitive for water resource professionals. The goal of this open-source project is to develop a low-cost, compact, robust, and mobile water quality data logging system deployable for a short or a long term in water bodies. The system aims to be as flexible, accessible, and serviceable as possible, even for users with limited experience with programming and/or electronics. Cheap, and off-the-shelf/3-d printed components enhance the reproducibility, customizability, and ease-of-maintenance of the system. The system (GatorByte) uses Particle family of Arduino compatible cellular-capable microcontrollers, open-source software, environmental sensors, GPS, SD card storage, accelerometer, and Bluetooth module to monitor, log, and transmit water quality data, and position periodically to a remote server in real-time over cellular network. Using off-the-shelf components, which are accessible and can be easily assembled, along with a custom circuit board limits the unit cost to less than $1,500. The sensing unit is complimented by a cloud-based datastore, web and mobile applications to visualize and analyze the data which adds a nominal monthly cost. The ultra-mobility is achieved by employing various power, and data transmission and storage optimization techniques. The system has a relatively small form factor similar to a 32 oz. bottle (10 in. x 3 in. Ø). GatorByte enables collection of water quality data at locations varying spatially in a cost-effective and reliable manner. The system's hardware and software are extremely flexible allowing researchers to scale and alter the system for their needs.

PRESENTER BIO: Piyush Agade is a PhD student at University of Florida. He has a Bachelor's in Electronics and Electrical engineering and has a Master's in Computer Science. He has two years of professional experience working as a web app developer at University of Florida. His research focus is water quality monitoring.