DIYAQI- an Educational Framework for Distrubted, Low Cost, and Open Source Air Quality Sampling

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some time

Abstract

Working air quality sensor meshes, or any large-scale distributed system can be overwhelming, especially to a high school student in their first computer science class. In this paper, we present a fully integrated framework for distributed air quality sampling with a focus on education and extensibility. Within this framework we have included a custom-designed embeded circut integrating 4 discrete air quality sensors and an ESP32 WiFi enabled microcontroller with a firmware written to be simple to set up yet easy to extend, a 3d printed enclosure designed to wisthand both indoor and outdoor environments, and docker-based NodeJS and MySQL stack for handling users, sensors, and data. All source files referenced in this paper are available at https://github.com/t3chy/diyaqi. We designed this project to be fully open source, with the software and hardware components Licensed under the GNU General Public License v3 and CERN Open Hardware License v2 (Strongly Reciprocal) respectively.

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