Software Engineer for UT Campus Air Quality Monitoring Project

Project Description

We plan to develop and deploy a sensor network on the university campus to provide continuously-measured indoor air quality (IAQ) monitoring of a few key pollutants: carbon dioxide, particulate matter of various sizes, total volatile organic compounds, and radon. We propose to use 10 sets of two, commercially-available devices to monitor these pollutants in addition to temperature and humidity. Two sets of devices will be placed in building spaces across the University of Texas at Austin that have similar use types: (1) small-capacity (<50 occupants) classrooms, (2) large-capacity (>300 occupants) classrooms, (3) on-campus cafeterias, (4) student common areas, and (5) building entrance lobbies. Measurements from these spaces will help identify typical concentrations of air pollutants that students are exposed to on a daily basis. In addition, facility and building managers can use these measurements to help make informed decisions regarding retrofits and other building improvements.

Project Website

Lab Website

Github Wiki

Qualifications

Required

1. At least, intermediary knowledge of Python and its popular data science libraries including Pandas, scikit-learn, Matplotlib and Seaborn for time series data analysis and visualization.
2. Experience using Git for version control purposes.
3. Experience developing and deploying web application on a cloud application platform.

Preferred

Knowledge of or experience with the following is not required but encouraged:

1. Jupyter for rapid development and prototyping.
2. Dashboard development and cloud deployment.
3. Google Firebase for application management.
4. GitHub Actions for automated workflows.
5. 3rd-party APIs for data management.
6. Environmental time series data exploration techniques and prediction modelling.

Project Timeline

Start in Fall 2021

Duties

1. Develop and maintain source code that handles sensor data retrieval and storage in a cloud-based database.

    - The preferred language for the source code is Python.
    - [GitHub](#) will be used for version control and as data storage option.

2. Develop, deploy and maintain user-facing dashboard that provides interface to visualize and download sensor data.

    - Dashboard may include user authentication for access control.
    - Dashboard may include a function for users to checkout sensors from a storefront for academic use.
    - Preferred dashboard development library is [Plotly](#) and preferred dashboard deployment platform is [Heroku](#) however, knowledge of and/or experience with other *free* dashboard solutions may be considered.

Typical Time Commitment

10 hours per week

Desired Length of Commitment

1 semester with the option to continue on for the Spring 2022 semester

Compensation

$13/hour up to the 10 hour per week commitment

Tags

IAQ, sensing, software, data management