GIS III A2 - SenseBox Vis

Everthing-about-my-community dashboard

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Objective & Motivation

The weather and air condition are always important factors that affect people's living quality. During the Corona situation, people now spend most of their time at home and hang around mostly close to the community. Therefore, it may be interesting to create a responsive web app that can inform users about the weather and air conditions about their community. With this regard, I decided to define my neighbourhood (i.e. Kreis Seebach) as my primary study area. As the app aim to provide users with detailed measurement of temperature, PM 2.5, and PM 10 in different timeframe, a dashboard is a good option for a concise and effective visualization. Hence, in this assignment, I designed and implemented a web dashboard for visualizing weather-related data.

Dataset

To enrich the dashboard, data from other resources are integrated together with the self-measured data. Table 1 shows a list of data sources used in the final product. The self-measured data are visualized in a map, while the external SenseBox measurements are presented in charts. Because there is no nearby active SenseBox installed near the community, a station in Schwamendingen is chosen.

Table 1 Data source

Name	Type	Location	Interval	Source
SenseBox Temperature	Self-measured	Around Oerlikon	1 second	—
SenseBox PM2.5	Self-measured	Around Oerlikon	1 second	—
SenseBox PM10	Self-measured	Around Oerlikon	1 second	—
SenseBox Temperature	External	Schwamendingen	1 hour average	https://opensensemap.org/explore/5e253fd4ff64c1001a8deb27
SenseBox PM2.5	External	Schwamendingen	1 hour average	https://opensensemap.org/explore/5e253fd4ff64c1001a8deb27

Name	Type	Location	Interval	Source
SenseBox PM10	External	Schwamendingen	1 hour average	https://opensensemap.org/explore/5e253fd4ff64c1001a8deb27
Seebach boundary	External	Seebach	—	https://www.stadt-zuerich.ch/geodaten/download/Kreisarchitekteneinteilung?format=10009

Dashboard design & implementation

Dashboard design

As the aim of the app is to provide detailed information of user's surroundings, three measurements (e.g. temperature, PM2.5, PM10) that focus on two aspects (e.g. temperature and air condition) of users' community are visualized. Because the temperature of the surrounding is constantly changing and it is more useful to present users with real-time data. Additionally, only the self-measured SenseBox data have dynamic positions, which is more intuitive to be visualized in a map, while external SenseBox data with consistent geolocation in charts. Therefore, the dashboard can be divided into two main parts: 1. a map showing the self-measured SenseBox data; 2. some charts with external SenseBox measurements.

Dashboard implementation

The web application is implemented with Vue.js and Tailwind.css. For the visualization of Sensebox measurement in a map, ArcGIS JS API is used. The project use Node.js as backend. The final product is deployed and published on Firebase and can be accessed via the link: https://wuti-web-app.web.app.

The structure of the app consists of three views: a dashboard view, a legal notice section, a privacy section, and an about-us. Vue.js with its component structure offers an easy solution to build different views for the app and can be designed individually. Specifically, in the map component, the data are rendered in different layers and can be toggled individually. Users can also interact with the map with standard manipulator widgets. When clicking on a point in the map, a pop-up with relative information will be shown.