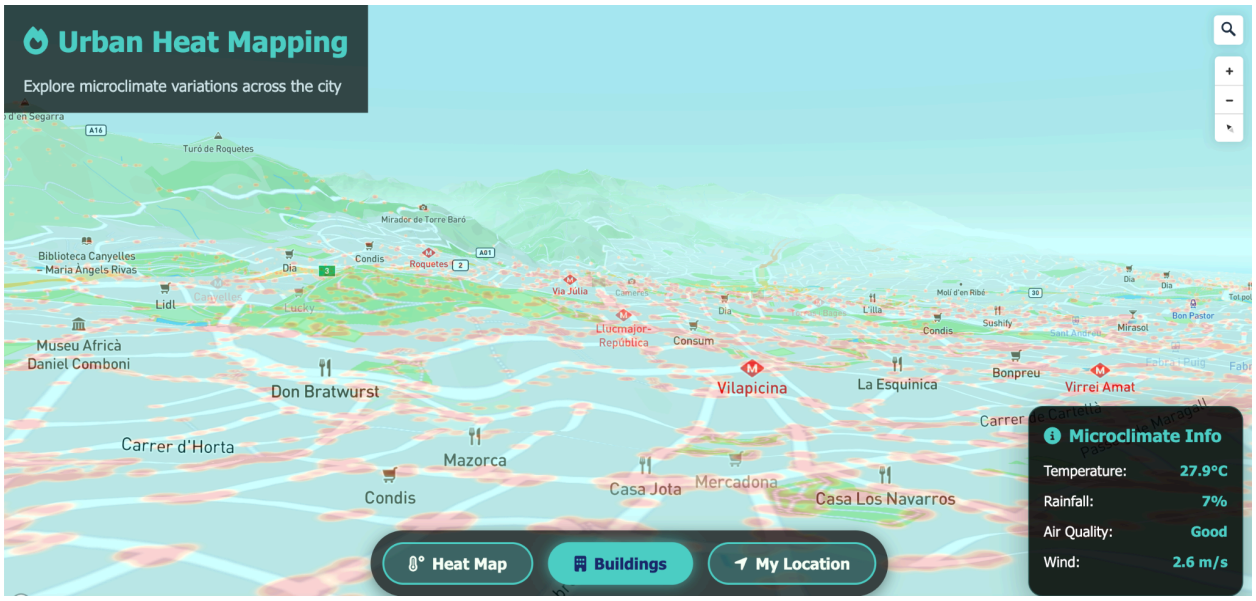
Urban Heat Mapping (UHM) - Exploring Microclimate Variation across the City

In this era of climate change, urban areas are excessively experiencing variations in microclimate. These changes significantly impact the liveability and environment of the area. While it is important to monitor these changes, at the same time, it is also meaningful to help people explore these variations in real-time. This is the idea behind The *Urban Heat Mapping (UHM)* app, which is designed to provide real-time data on climate conditions and visualizes temperature, rainfall, air quality, and wind patterns across the city.

Features

The features of the app include:

- Live Microclimate data provides users with real-time microclimate data on rainfall, temperature, wind, and rainfall.
- Location-based access to provide localized condition of the climate upon opening the app.
- Interactive visualization which is built on Mapbox, providing an engaging interface.



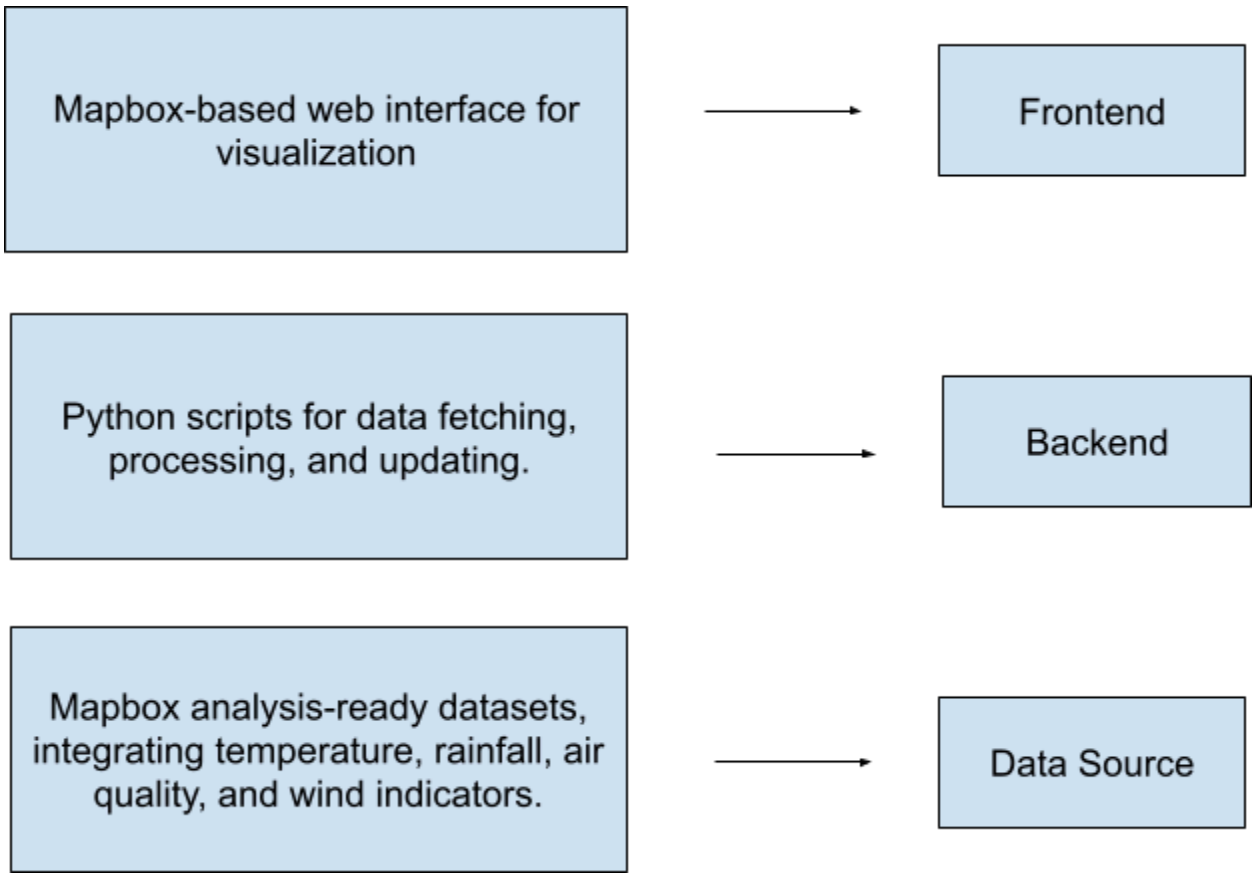
Data Processing

For the analysis, Mapbox analysis-ready-to-use datasets have been used as the primary source. Initially, it was planned to use satellite imagery and utilize fine-grained and more detailed microclimate data. However, the issue we faced was a large volume of satellite data, causing computational constraints.

Backend

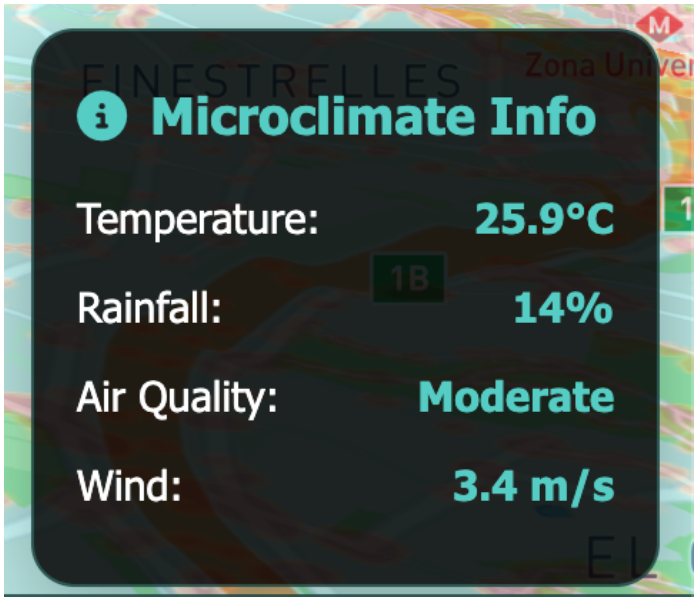
To power the backend, we have used python script. It continuously updates and processes the live data, ensuring everything in the app is up-to-date.

Here is an overview of the technical stack for the application.



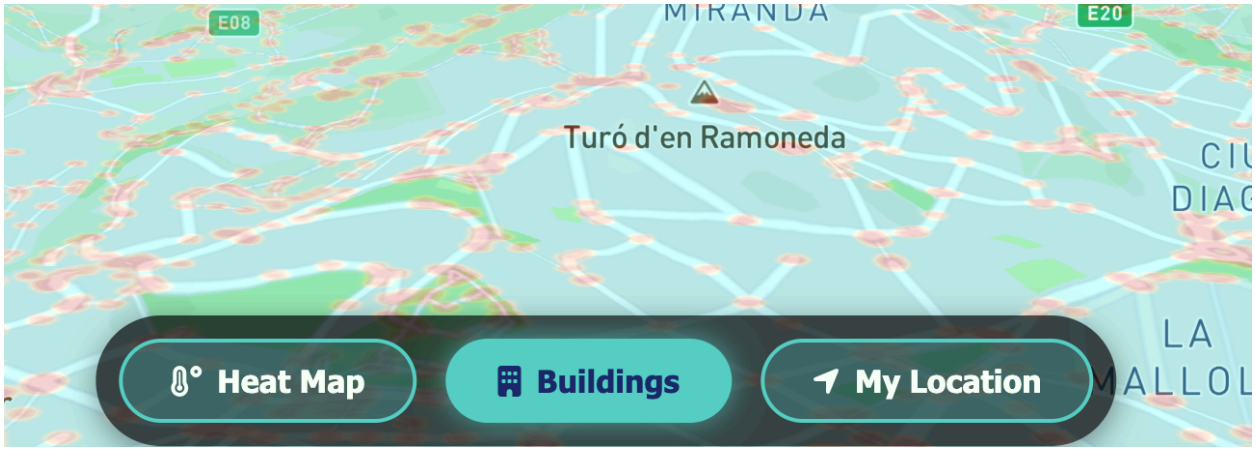
Interactitivity

The app has the following interactive features:

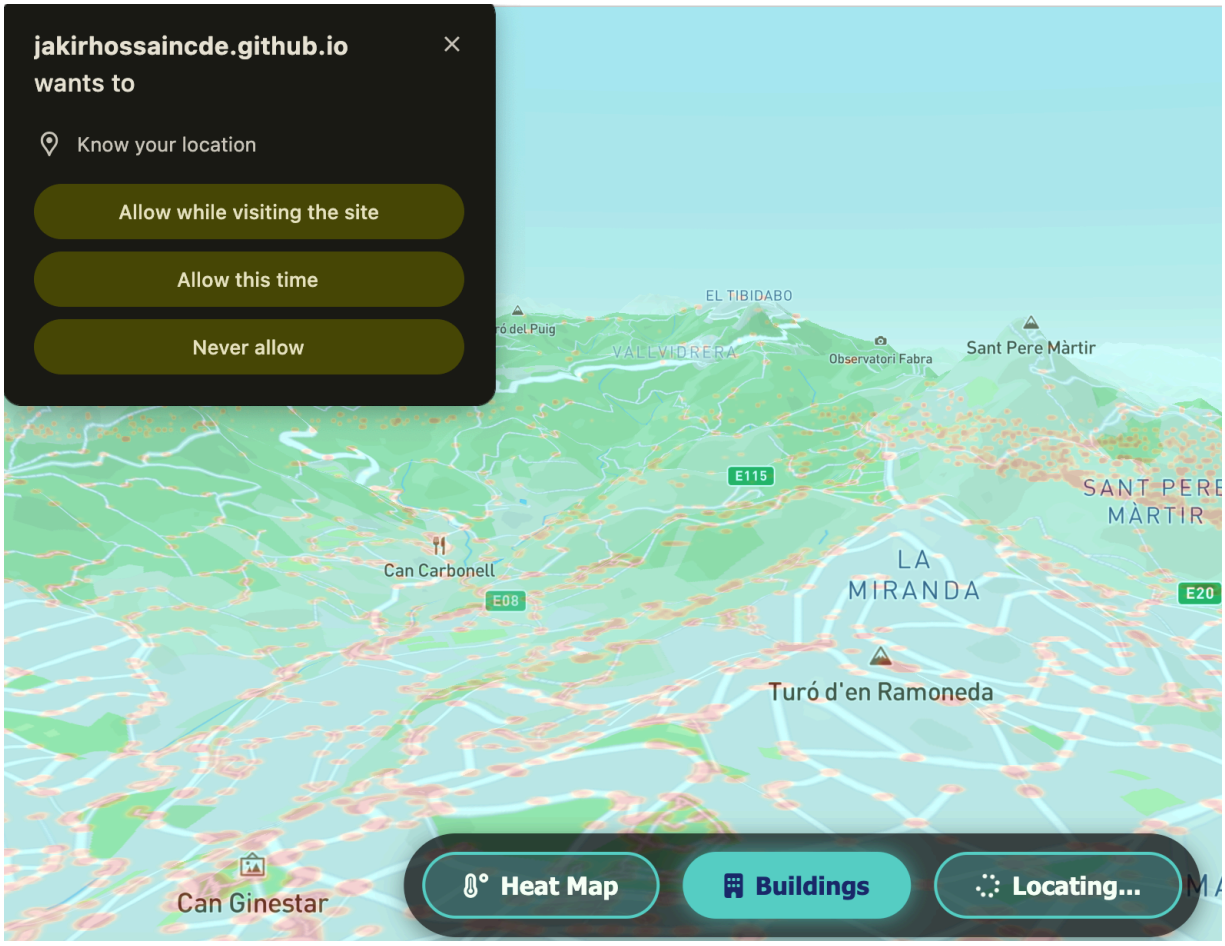


- Information box providing the info on climate conditions.

- Zoom-in and Zoom-out feature.



- Different visualisation options for buildings and heatmap.



- Live location feature.

Applications of the App

This app is a small effort, but it can serve as a multipurpose platform, such as:

Public Awareness: Increasing understanding of how climate varies within cities and how it affects daily life.
Research and Education: A useful resource for climate-related studies, geography, urban planning, etc.
Decison-Making: An app like this can be a proper platform for planners to identify urban heat islands and make climate-resilient design decisions in their city.