

# An Artistic Data Visualization of Pollution at Earlham College

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## Introduction

ECAir is a system which collects air pollution data on the campus of Earlham College (figure 3), and creates an artistic visualization of that data in the style of Dutch artist Mondrian. Air pollution is an ever-growing concern not only for our health but also for the planet as it contributes to global warming [2]. One way to spread awareness about it, is to create informative data visualizations. Data visualization plays a vital role in understanding existing data, as well as in presenting the findings derived from the data. However, the aesthetic component of a visualization is often overlooked.

## Motivation

- Visualizations would be significantly more informative to the public if they were permanently displayed somewhere, the way that artwork typically is.
- Air pollution is a problem that we have the ability to obtain data on, yet, there is little awareness of how much damage is caused by our daily decisions [1].
- An aesthetically-pleasing visualization has the potential to be provocative and engaging [3]. With regards to pollution, if the viewer of the visualization is more provoked, they may, for example, choose not to drive when it is not necessary.
- The components of a Mondrian-style painting are the three primary colors, the lengths of the lines, and the sizes of the rectangles (figure 1) [4].

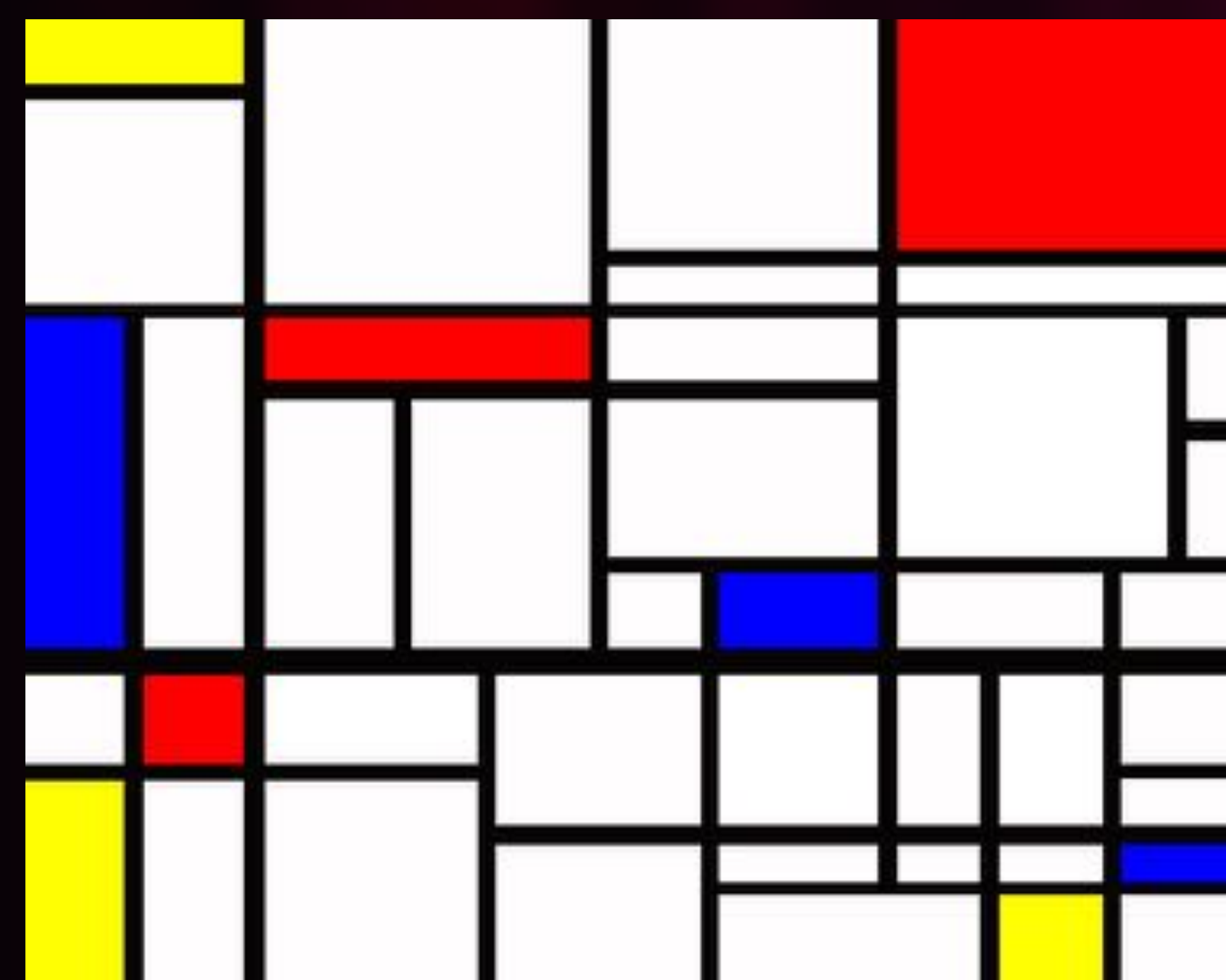


Figure 1: Example of a Mondrian-style painting

## Method

- ECAir aims to be accessible and easy to modify, which is why it uses Arduino Uno. It has simple functionalities, and rich web content on how to use it.
- The data is collected using the MQ-135 air quality sensor, which provides one value. One reading is collected every 3 seconds for 2 minutes at each location. The higher the number, the worse the air quality.

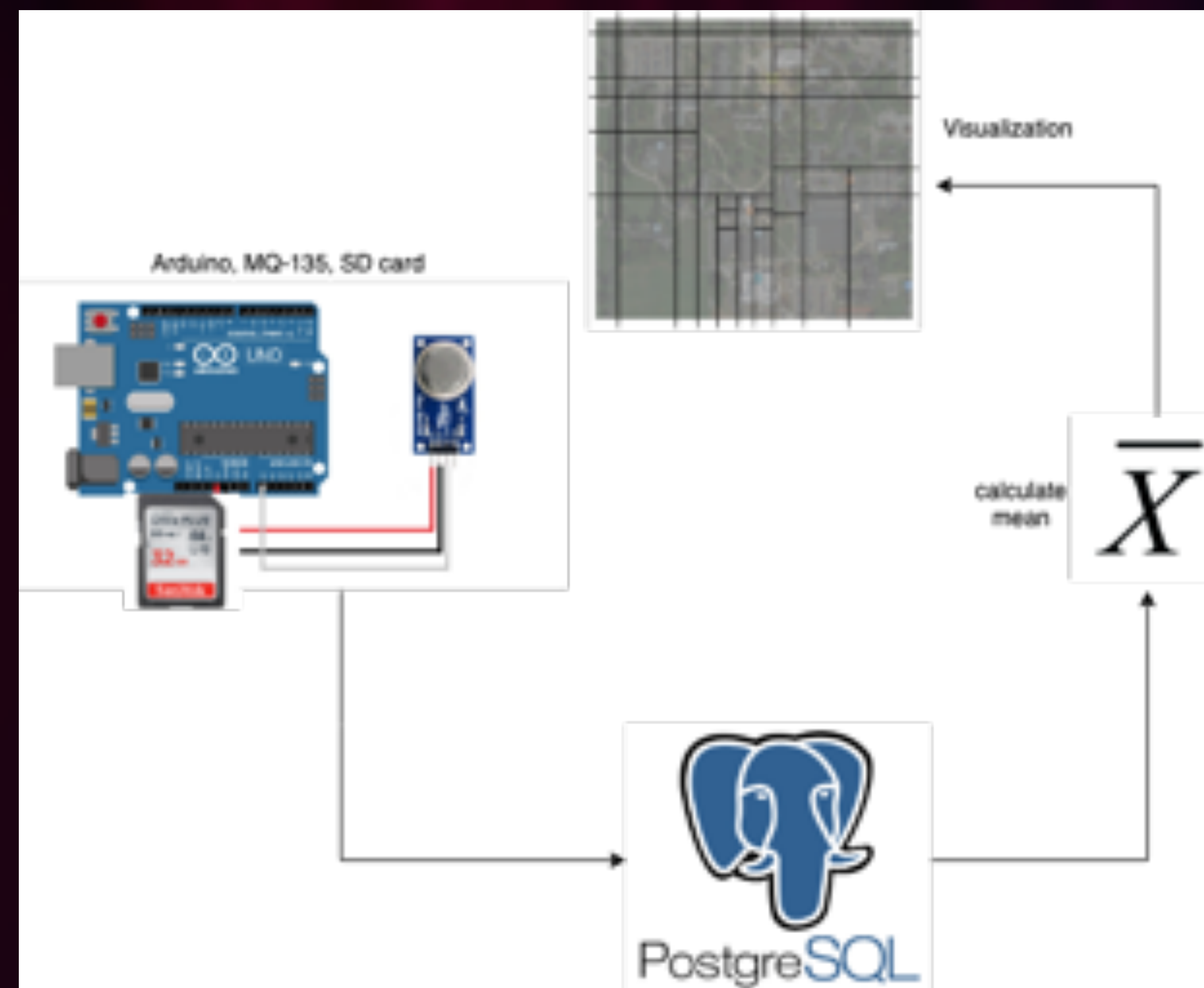


Figure 2: Flow of data in ECAir

- The data is written to an SD card, then moved to a database.
- The lengths of the lines and sizes of rectangles are determined by the distances between the buildings on campus.
- The colors are determined by the air quality. The colors are relative, where blue is the best air quality, yellow is worse and red is the worst.



Figure 3: Data collection points

## Discussion

- ECAir combines the simplicity of Arduino and Mondrian's style to provide an accessible way to incorporate informative art into the environment, and spread awareness.
- It can be used with different sensors to create visualizations of multiple types of data.
- It helps fill the gap between art and data visualizations.

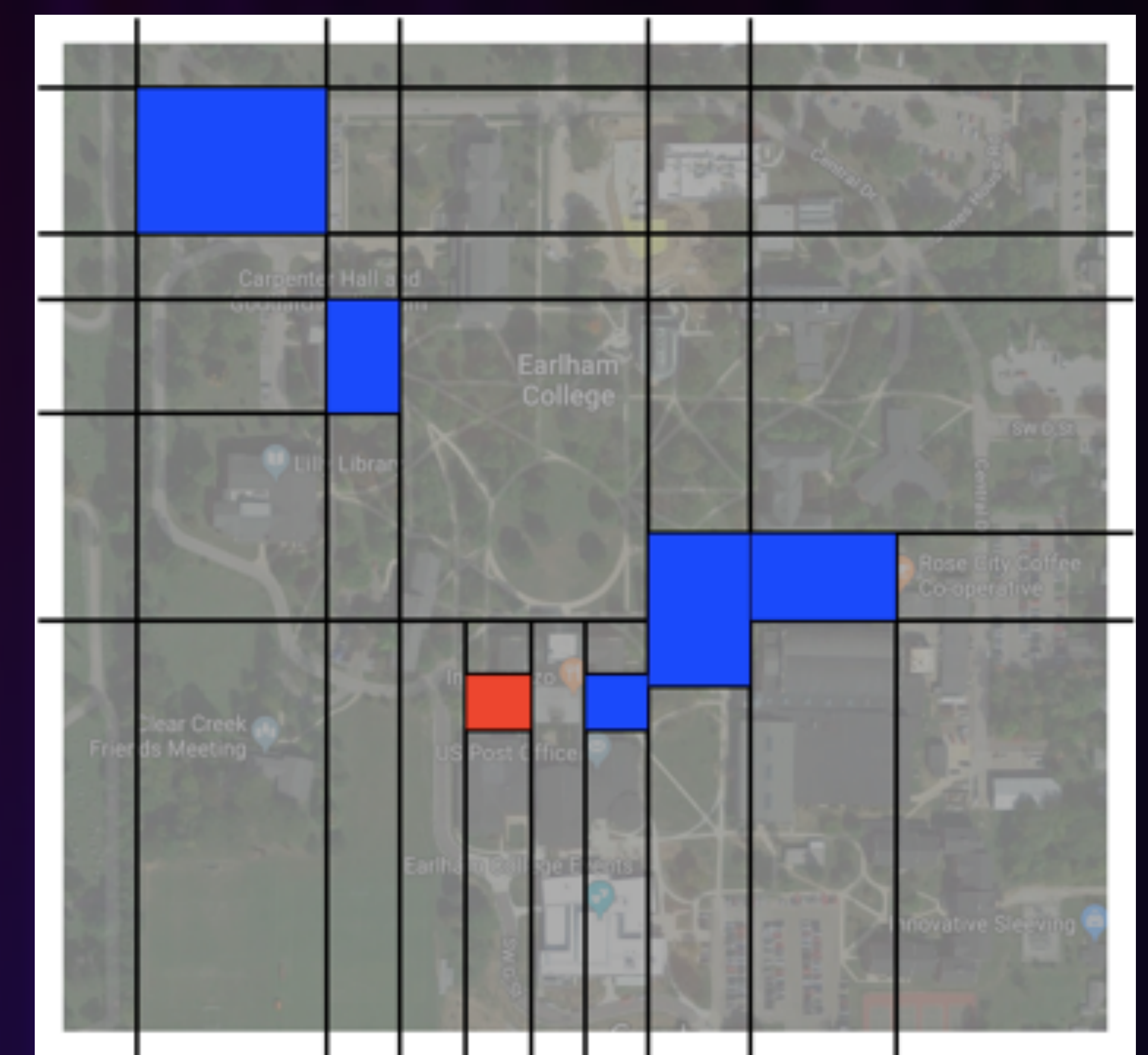


Figure 4: Air pollution visualization

## Future Work

- With an addition of Wi-Fi enabled Arduino boards, ECAir can be set up to provide an aesthetically pleasing, real-time visualization for pollution data in large cities.
- Connection to a website that will allow access to the visualizations, and possible interactive features.

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