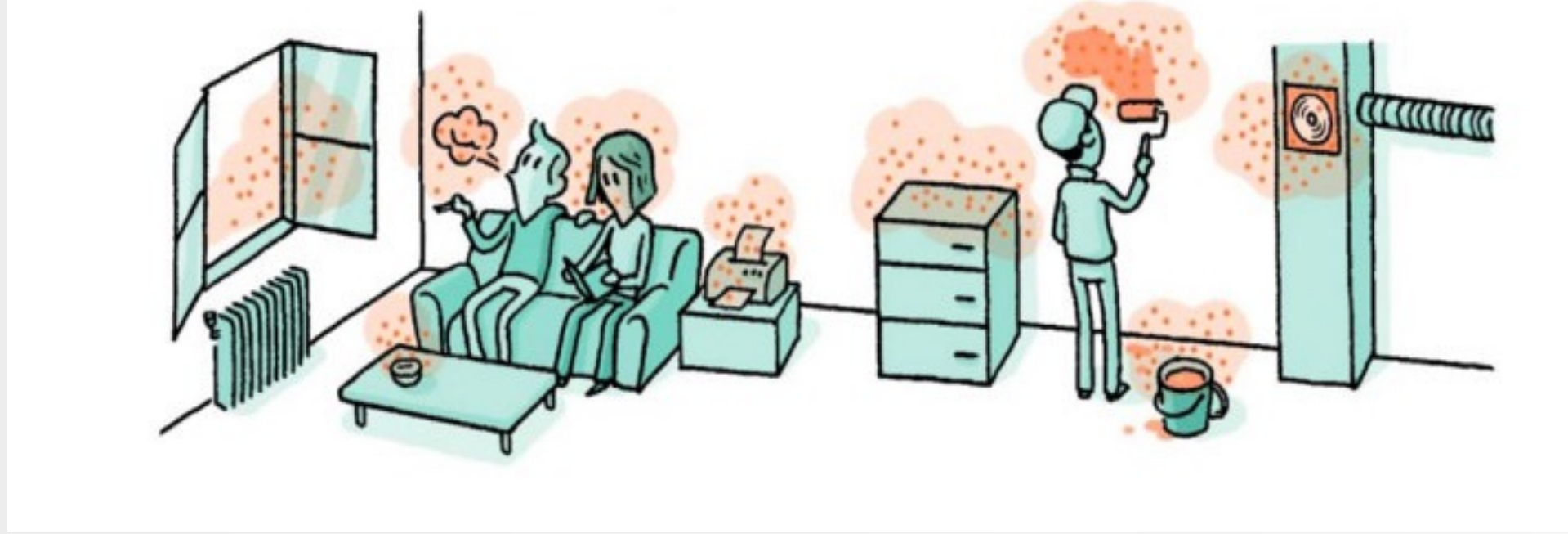


# Smart Monitoring of Air Quality



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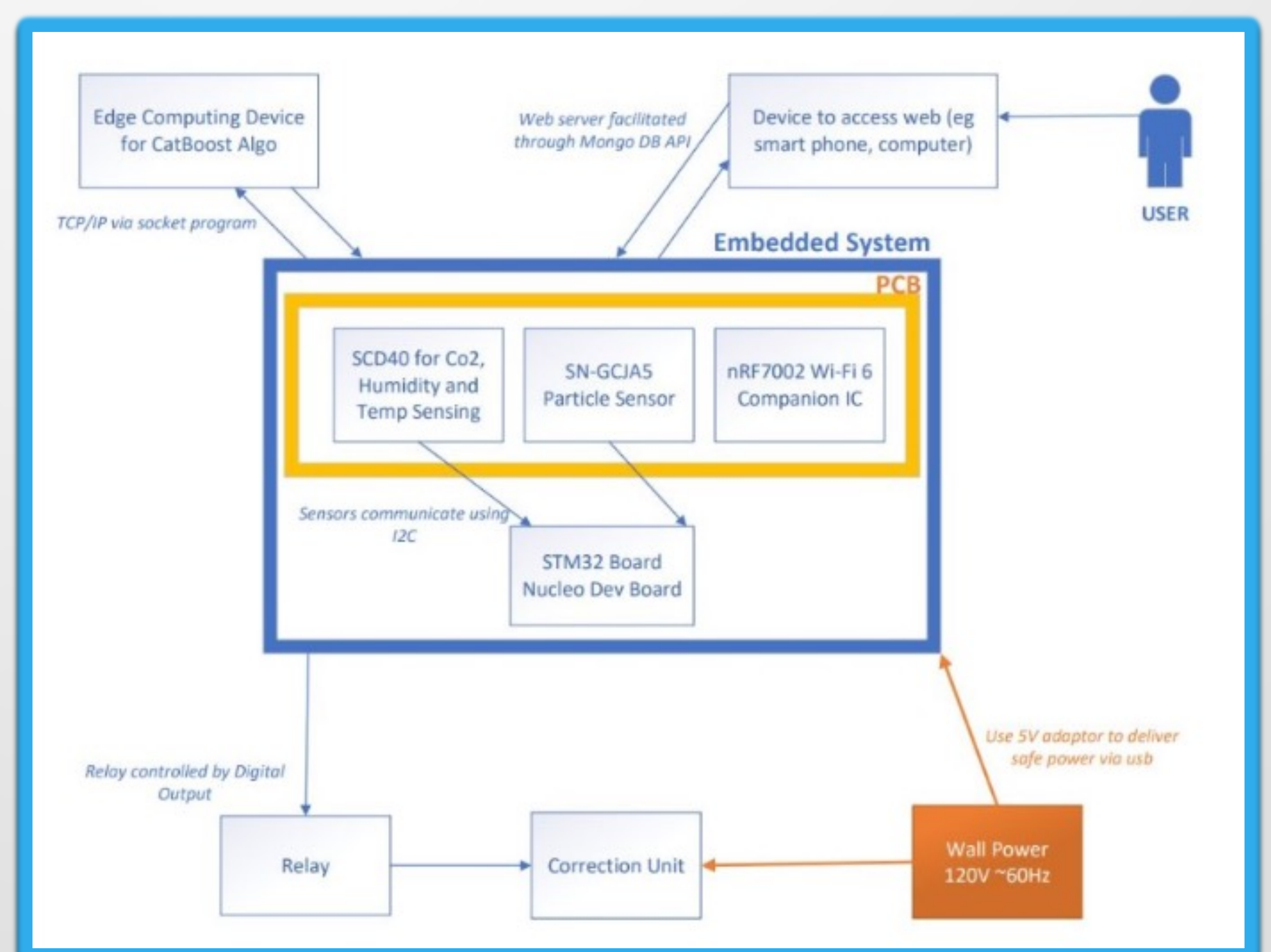
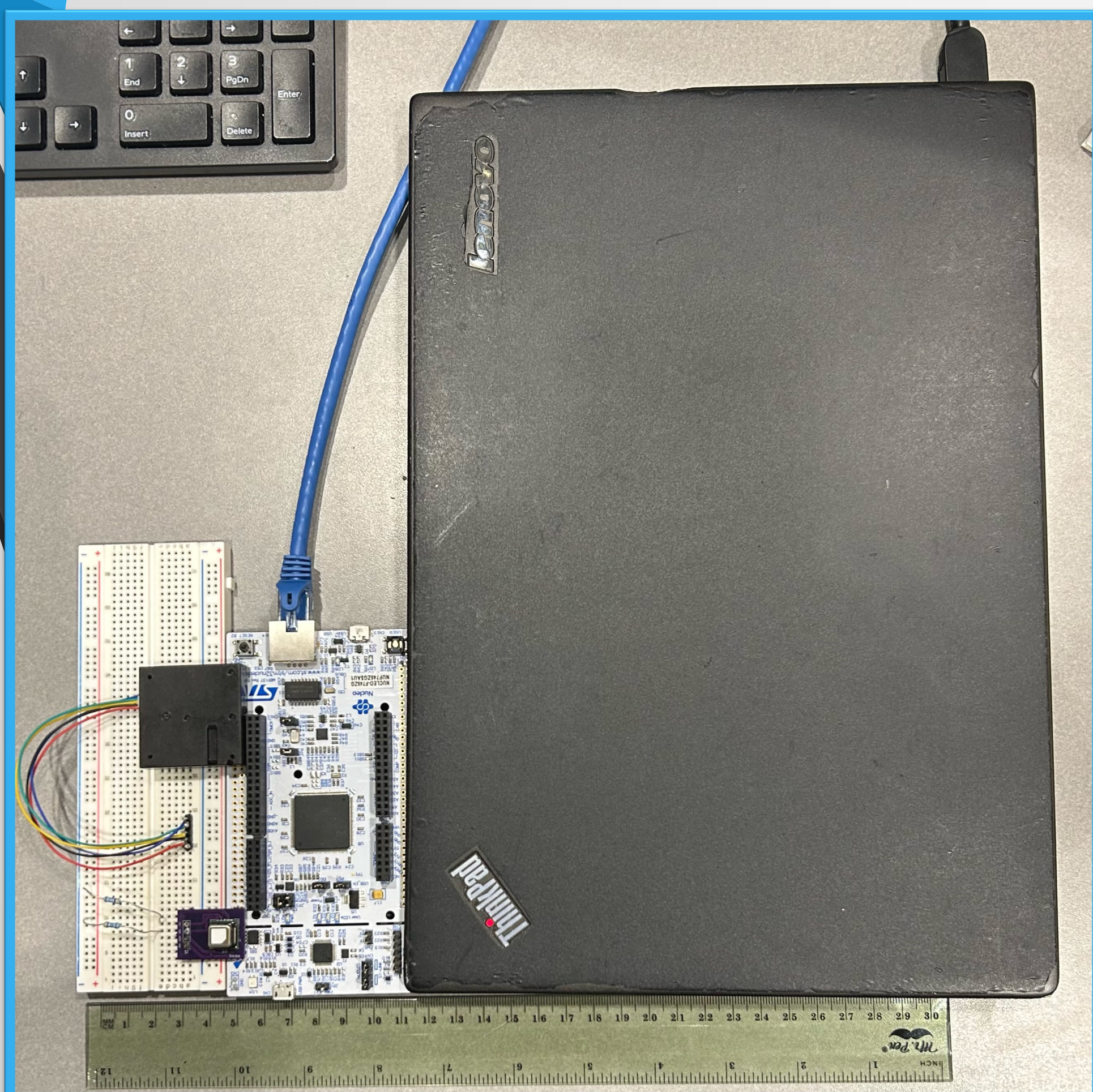
## Problem Statement

- Individuals spend 90 percent of their time in both private and public indoor environments (gyms, homes, workplaces). Therefore, indoor air quality (IAQ) has a significant impact on health and quality of life in general.
- For most of the population, the health risks yielding from exposure to indoor pollutants may be harmful than those from outdoor pollution.
- The most common form of air quality monitoring is simple CO<sub>2</sub> sensors, so it is imperative that more options appear to successfully indicate the health of an environment for risk prevention

## Proposed Solution

Smart Monitoring of Air Quality (SMAQ) combines multiple disciplines of Electrical and Computer Engineering to provide a better way to monitor and correct unhealthy indoor environments

- **Embedded System:** Microcontroller utilizes sensors to collect readings of humidity, temperature, carbon dioxide, and particle matter.
- **Machine Learning:** Gradient categorical boosting model takes sensor readings and singular air quality index calculation to classify into several buckets (Satisfactory, Acceptable, Unhealthy) to better clearly inform user. Keeps efficiency in mind as sensor readings are being updated constantly and we are working with large data
- **Wireless Networking:** MCU hosts a server to display metrics and sensor readings on the go, user-friendly interface provides constant monitoring. Allows for updates to be checked whenever convenient and is portable.



SMAQ looks to improve the monitoring of unhealthy environments and provide ease of mind to consumers regarding health and quality of life. The project can be continued to be made more precise and ubiquitous, possibly removing the need for internet connection.