

PROJECT WEATHER STATION

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Introduction

The goal of Project Weather Station was to create a system that collects weather related data which is then presented on a dynamic web page. This was to be achieved by utilizing temperature and humidity sensors with Arduino Uno and Raspberry Pi microcontrollers.



FIGURE 1. Microcontrollers

Objective

The objective of creating a weather station was to be accomplished by having Raspberry Pi act as the core of the system. The microcontroller was pursued to receive weather data from a sensor-equipped Arduino Uno, save that to its self-hosted database and then present it on a web user interface. Each member would have an area of responsibility of their own to develop which together would form a fully functioning system.

Methods

To measure the weather Arduino Uno was paired with temperature sensor KYT81-110 and humidity sensor H25K5A. The sensor values were read and programmatically calibrated to appropriate formats. The two microcontrollers Arduino Uno and Raspberry Pi were connected together with a serial USB cable. To build the dynamic web application Raspberry Pi was provided with the installed LAMP software bundle: Linux operating system (Raspbian), Apache HTTP Server, MySQL database and PHP scripting language. As the middleman in the continuous transfer of weather data between Arduino Uno and the MySQL database Raspberry Pi ran a script written in Python programming language.



FIGURE 2. Weather Sensors

Results

The system successfully gathers and visually presents weather data as was planned. The sensor values are read and processed on Arduino Uno, transferred to Raspberry Pi, saved to the database and retrieved from there by the web application to provide the end user with. The system is reliably functioning and the user interface is convenient and pleasing to the eye.

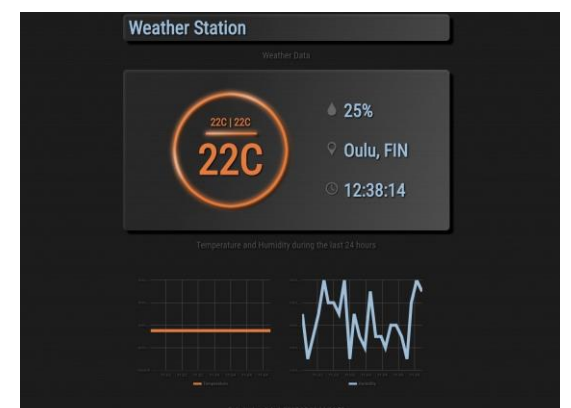


FIGURE 3. Weather Station Web UI

Conclusion

The end product of the project is a complete standalone embedded system measuring and providing weather information. The project was rewarding for the team, in the sense that considerable amount of learning was done and the original objective was achieved.

Project

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