Simple Weather Station Using ESP32

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Outline

Aim

Use machine learning to build a simple weather station with a web interface using a PT-100 and ESP32.

Hardware

1. ESP32 microcontroller with Type-B USB cable
2. PT-100 RTD
3. Breadboard and Jumper Wires
4. Android phone
5. (Optional) USB 2.0/3.0 Hub

Software

Relevant codes can be found here.

1. In the `client` directory, type `pio run` to generate the firmware to flash to the ESP32.
2. Using ArduinoDroid, flash it to the ESP32 from your Android phone.
3. Run the server by typing `flask run --host=<YOUR HOST IP>` from the .

Setup for Experiment

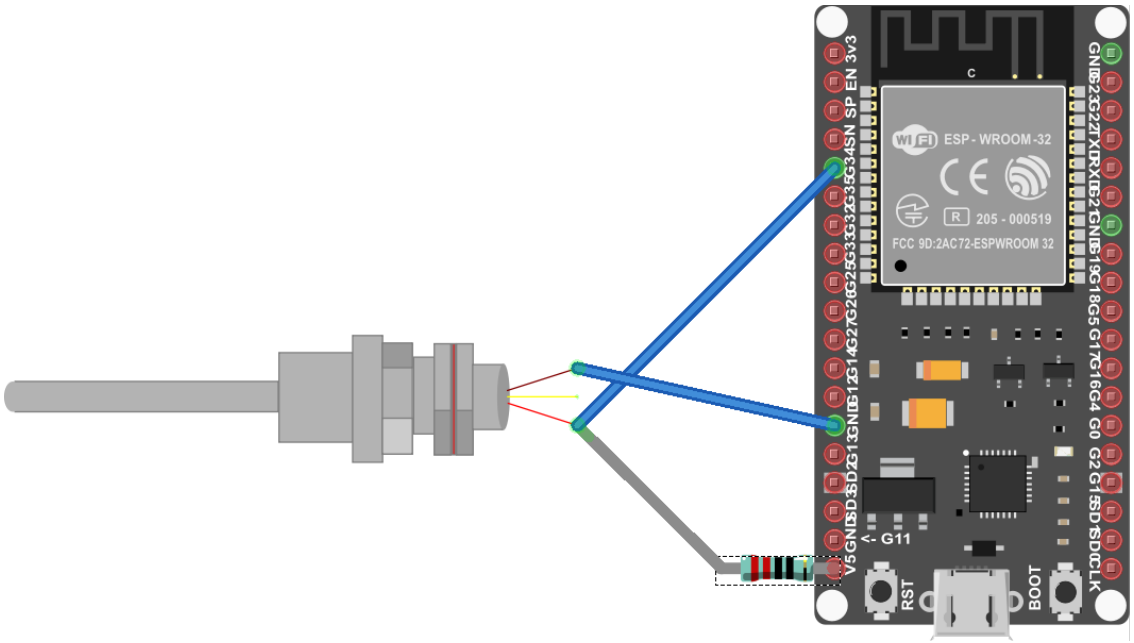

Figure: Setup for Weather Station.

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3. We can use the least mean squares method to find the coefficients.
4. The calculated coefficients are

$$\mathbf{W}_{opt} = \begin{pmatrix}1.553\\ 3.25 \times 10^{-3}\\ -8.68 \times 10^{-6}\end{pmatrix} \tag{3}$$

In-Class Demonstration

Thank You!