Allegro

Fast, Light, Airy

The Allegro air quality detection system will ensure the safety of you and your laundry! Furthermore, Allegro informs you if your laundry will be properly dried based on the current ambient conditions.

Problems

- Uncertainty on whether to do the laundry due to inconsistent weather
- Risk of fire in the laundry room
- Risk of producing poisonous gases due to improper storage of detergents

Solutions

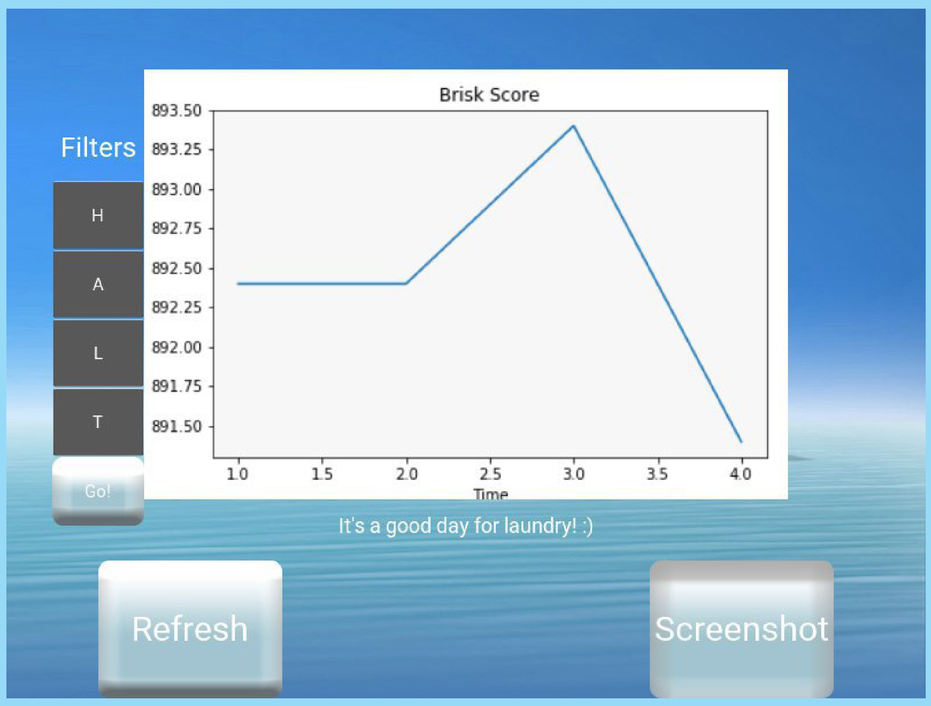
- Collect data for reference
- Train the program to give accurate readings
- Allow the sensor to detect and predict air condition
- Calculate and show the suitability for drying laundry

Benefits

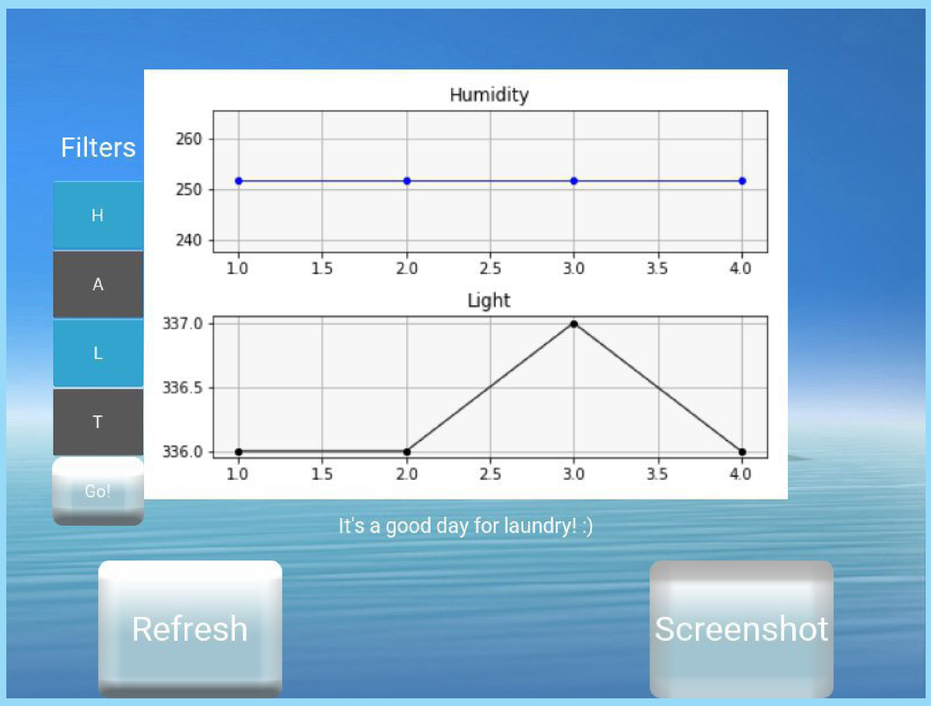
- Automatic detection and assessment
- Allows the laundry to dry properly
- Alerts user in the event of danger

Device setup and usage directions

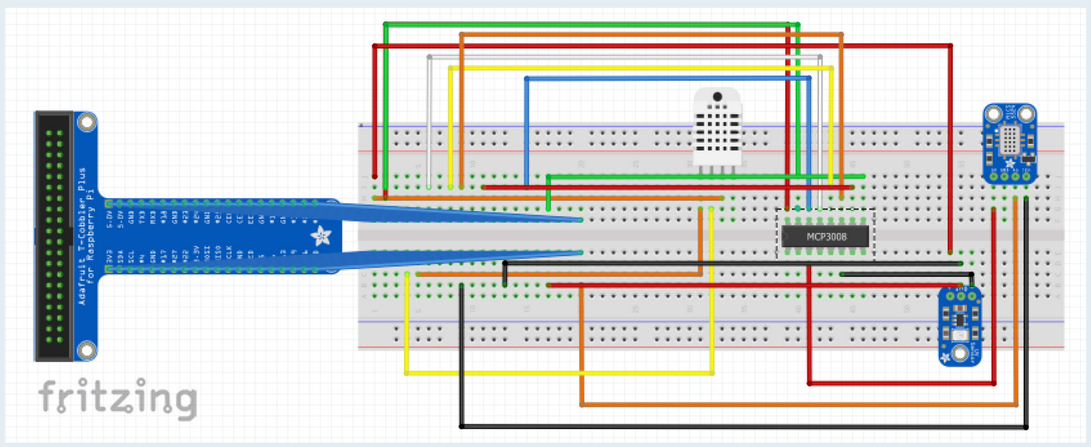
1. Place the system in the laundry room, on the wall or anywhere close to the laundry but not blocking the way or at risk of damage by bumping or spills.
2. When you want to do laundry, use the Kivy GUI to check for favourable conditions.
3. The display screen will periodically update with a graph of 'laundry quality' score. This is calculated based on all 4 sensor readings.



4. By selecting filters and clocking 'Go', you can display graphs of individual metrics. This allows you to compare over the same time frame.



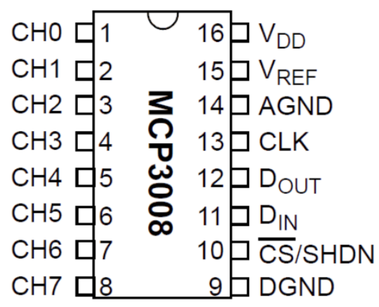
Schematics



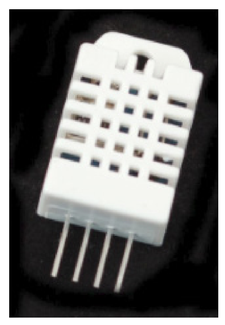
In the design of Allegro, we chose to employ a few sensors for the sake of collecting data. These are laid out in the schmatic diagram on the breadboard above.
This setup was designed such that we could employ a mix of analog and digital sensors (as the RB-Dfr-25 and MQ-135 are analog, and the DHT2302 has digital output). They are connected to an 8-bit ADC (MCP-3008) which is then mapped onto the GPIO cobbler.

Light sensor (RB-Dfr-25)
Detects ambient light intensity

Gas sensor (MQ-135)
Detects smoke, benzene, alcohol



Analog-Digital converter
Required for light and gas sensors



Temperature and humidity sensor
0-100% humidity, -40 to 80 °C