

Interaction Assignment

Laurie Waxman
Data Design Code
Winter 2014

Weather Light*

The Weather Light is a physical interpretation and visualization of weather data from The Weather Underground, a website that provides weather forecasts and other weather data for the U.S. and the world. It is meant as an atmospheric piece rather than a practical weather displaying device.

The Weather Light will be a ring about 25cm in diameter, covered in dangling white fabric strips of various lengths. There will be 20 RGB LEDs attached to the end of the fabric strips every 4cm or so. Inside the ring, a fan will blow in accordance with wind conditions. The fan will blow stronger when the wind is blowing at higher speeds. Meanwhile, the LEDs will change colour based on weather conditions. For example, when it is cloudy, the LEDs will glow a pale cyan, when it is snowing, they will glow pure white, and when it is raining they will glow blue.

The Weather Underground API

The Weather Underground API provides data such as current weather conditions, forecast, and history for major cities worldwide, as well as access to weather maps, graphics and radar images. The Weather Light will require only current conditions.

Documentation

<http://www.wunderground.com/weather/api/d/docs>

Limits

The API will only allow 10 calls per minute. If this is exceeded, however, The Weather Underground gives its users several chances before blocking them out of the system for 72 hours.

Data

The following is an example of JSON returned from this API.
<http://api.wunderground.com/api/824d574f76ba0b52/conditions/q/Canada/Montreal.json>

Other Technologies

The Weather Light will use Processing and Arduino to connect its physical body to the data from The Weather Underground.

Processing

“A programming language, development environment, and online community.” Weather Light will be using it to pull data from the Weather Underground and send it to Arduino.
<http://processing.org/>

Arduino

“Arduino is an open-source electronics prototyping platform used to create interactive objects or environments.” Weather Light will be using Arduino to control its fan and LEDs. LED output means a limited colour palette as there is no desaturation, only dimness and brightness.
<http://arduino.cc/>

Process and Functionality

As there are several components to this project, many steps will be necessary in order to achieve it.

- 1 The Processing software will read data from the API
- 2 It will then convert the weather conditions to numbers to be sent to the Arduino software. It will also send wind and wind gust speeds in km/h.
- 3 The Arduino software will take the weather condition numbers and set the LEDs to the corresponding colours. It will take the wind speeds and alter the speed of the fan accordingly.

Weather Conditions

In order to keep the Weather Light from being completely static, the colours of the LEDs will not always remain the same for each weather condition, but will fade from one to another. For example, if it is raining, they will fade from pure blue to a lighter cyan-blue. In the case of thundershowers, the LEDs will be solid blue but flash yellow at random intervals.

The weather conditions will first be converted to numbers based on key words. The key words and their corresponding numbers and LED colours are listed below.

- | | | | |
|---|---|---|-----------------|
| 0 |  |  | Clear |
| 1 |  |  | Overcast |
| 2 |  |  | Cloud |
| 3 |  |  | Rain/Drizzle |
| 5 |  |  | Snow/Hail/Sleet |
| 6 |  |  | Mist/Haze/Fog |
| 7 |  |  | Thunder |

Wind Conditions

The fan will spin at a speed determined by the software. Every so often, it will blow stronger for a few seconds in relation to the wind gust speed.

Overcast



Clear



Materials and Parts

These are the electronic parts and other physical materials this project will require.

- 1 a small toy motor, and fan attachment
- 2 white fabric strips
- 3 RGB neopixels
- 4 a transistor
- 5 various wires/cables
- 6 an Arduino
- 7 some rope/usb cable disguise

