**iUmbrella**

**What is it?**

iUmbrella is a smart device that visually alerts the user on the chance of rain by using LEDs.

**Idea Behind**

The idea behind this product was to ensure the user never leaves their umbrella behind in the morning when it is likely to rain. It means they will never take the risk of not taking it as they know instantly if it is a good idea.

In addition, when out and about it will still alert them on the chance of rain so they can plan their journey accordingly.

**Innovations to existing devices**

There are currently no popular umbrellas on the market that do what iUmbrella does. It is a unique product and added functionality, usability and aesthetics.

**Difficulties**

1. Wiring up the LED strip correctly to the mbed board proved tricky. We had to check the voltage output on an oscilloscope to see if we had set the pins up correctly in the code.
2. Controlling the LEDs on the strip wasn’t an easy thing to find how to do but we managed to find a library and example program which we could adapt to suit our project.
3. We then adapted a GATT example program so the mbed could communicate with a smartphone. We successfully managed to remotely turn the LED on and off and also do it when a value sent to the mbed changed. However, when we went to merge this code with the LED strip code it wouldn’t work. We tried for a long time to debug this but concluded it was something to do with the imported library. Therefore, we are now using normal LEDs.
4. Possibly the largest challenge was writing an Evothings javascript application to fetch the current chance of rain through a PHP web server and output purely the probability. This was achieved using a forecast API. This probability is then passed to the mbed which lights the corresponding LED to alert the user on the chance of rain.

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