Motifit

Alicja Kowalewska - José I. López - Bram Winter
https://github.com/winterworks/Motifit

Contents

- Introduction to your project
- Key requirements
- Technical challenges
- Choice and sensors/actuators/web-data sources
- How do you plan to test
- Introduction to your github repository

Which one do you choose?

VS

Our goal

- Make students and teachers more **aware of their behavior**
- Increase their **motivation** to improve their own health

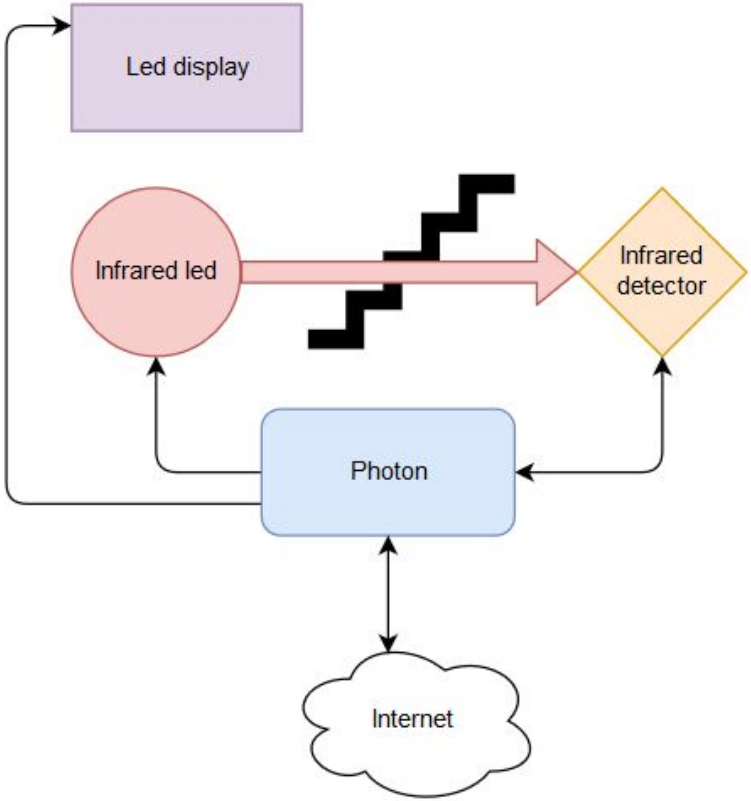
How?

- **Show** the amount of people that have taken the stairs during the week
- Set and show **goals** for weeks
- Show a comparison between different buildings and departments to improve **competition**

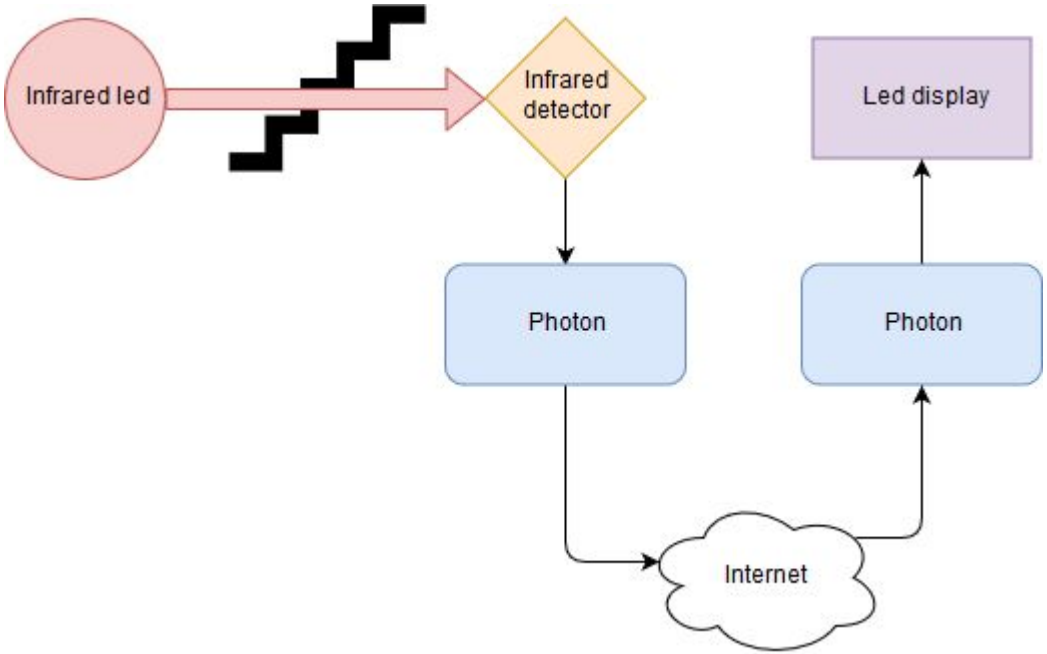
Like biking


Aarhus Cykelby
Cyklister i dag
2287
18:46
Cyklister i år
1.000.000
900.000
800.000
700.000
600.000
500.000
400.000
300.000
200.000
100.000

First Concept



New Concept


Infrared led
Infrared detector
Led display
Photon
Photon
Internet

Requirements

Photon:

- Needs to upload data
- Needs to download data from other locations
- Connection does not need to be consistent
- Communication between Photons

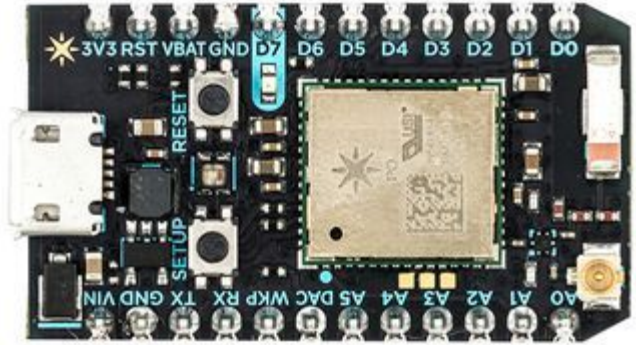
Led display:

- Can run on a schedule (not always on)
- Should give the user information a simple way that can be understood in a second.

Infrared sensor:

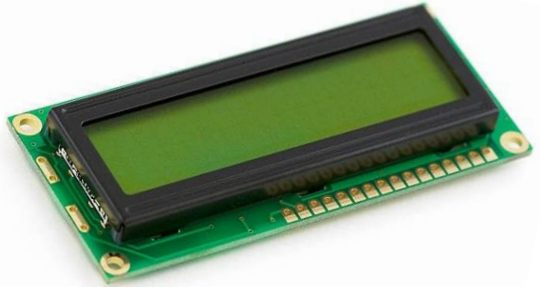
- Can detect an infrared light across a few Distance
- Can detect when this is blocked for a 0.1 seconds
- Can filter out the sunlight

Hardware



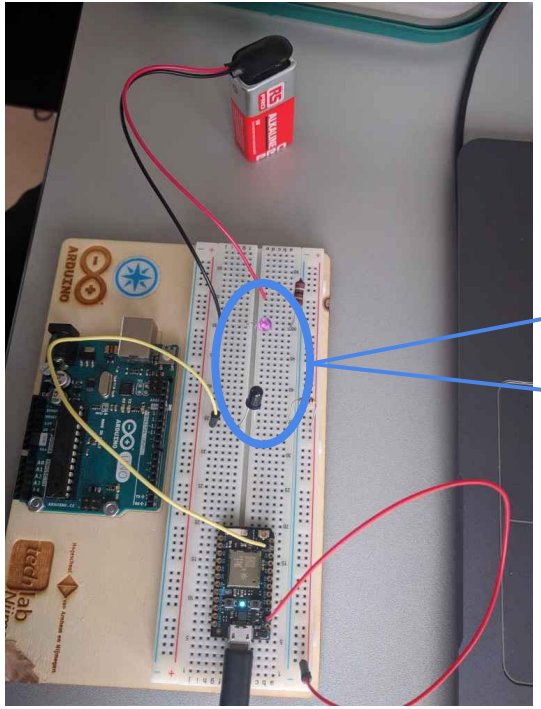
Particle Photon

Infrared light and detector



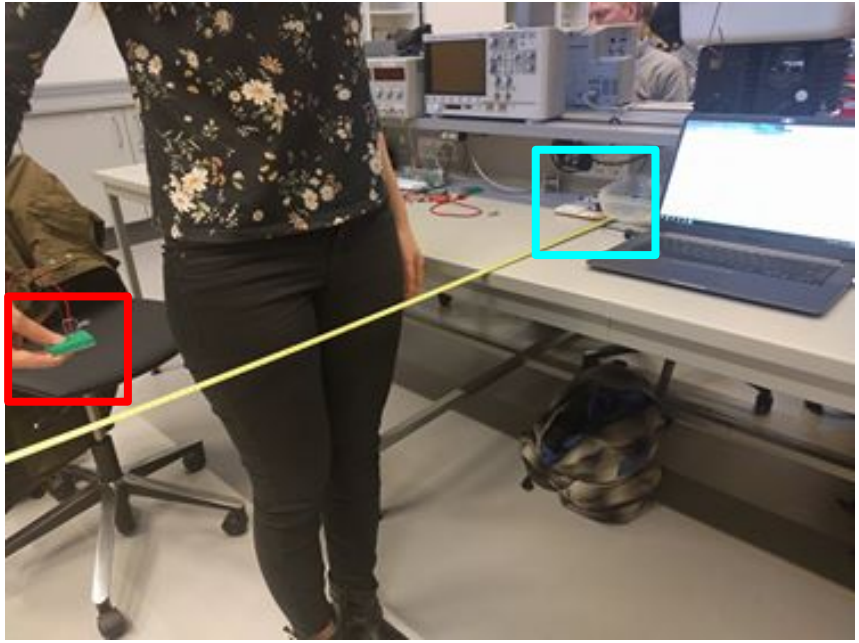
Led display

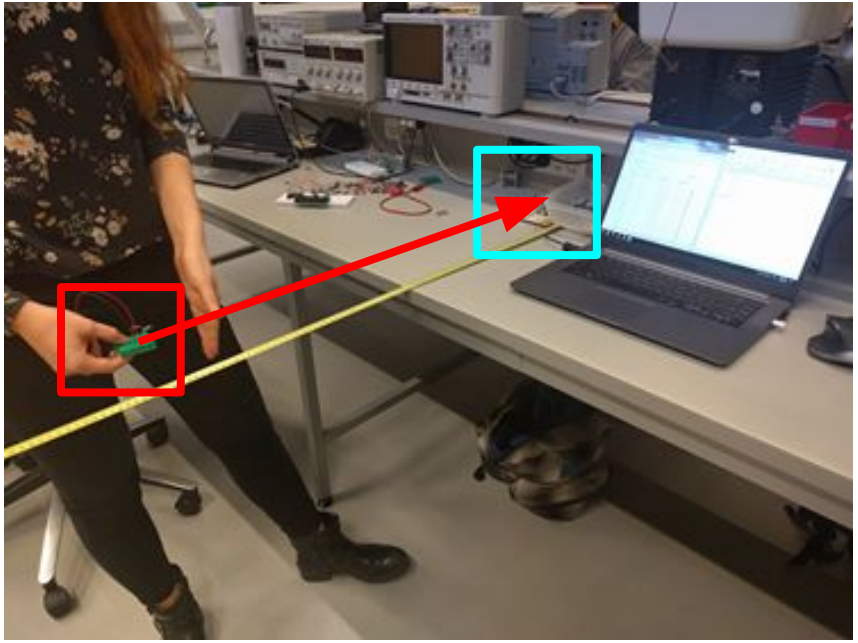
First infrared test



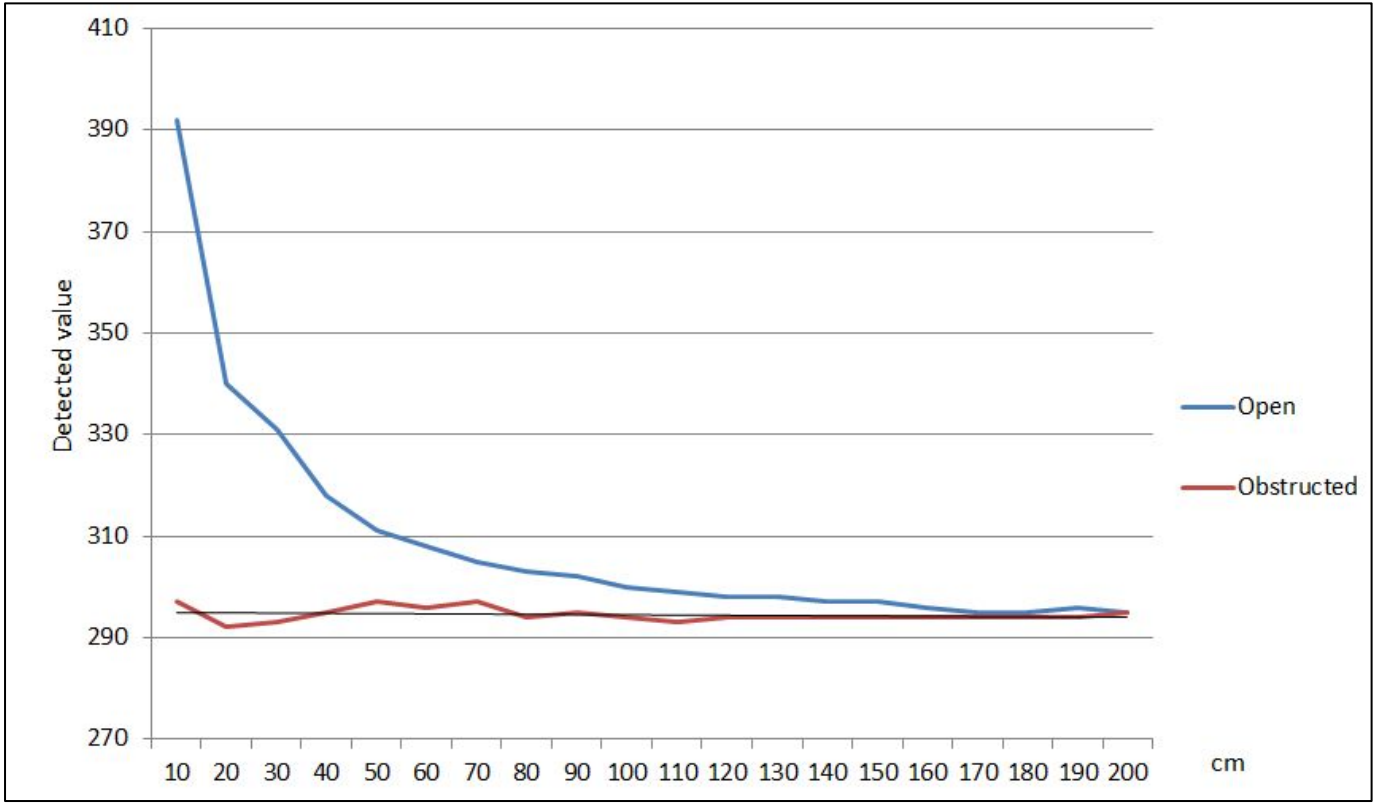
detecting	285	European_swallow	10/22/18 at 3:02:33 pm
detecting	286	European_swallow	10/22/18 at 3:02:29 pm
detecting	333	European_swallow	10/22/18 at 3:02:27 pm
detecting	287	European_swallow	10/22/18 at 3:02:21 pm
detecting	348	European_swallow	10/22/18 at 3:02:17 pm
detecting	337	European_swallow	10/22/18 at 3:02:13 pm
detecting	344	European_swallow	10/22/18 at 3:02:09 pm
detecting	292	European_swallow	10/22/18 at 3:02:05 pm

Testing

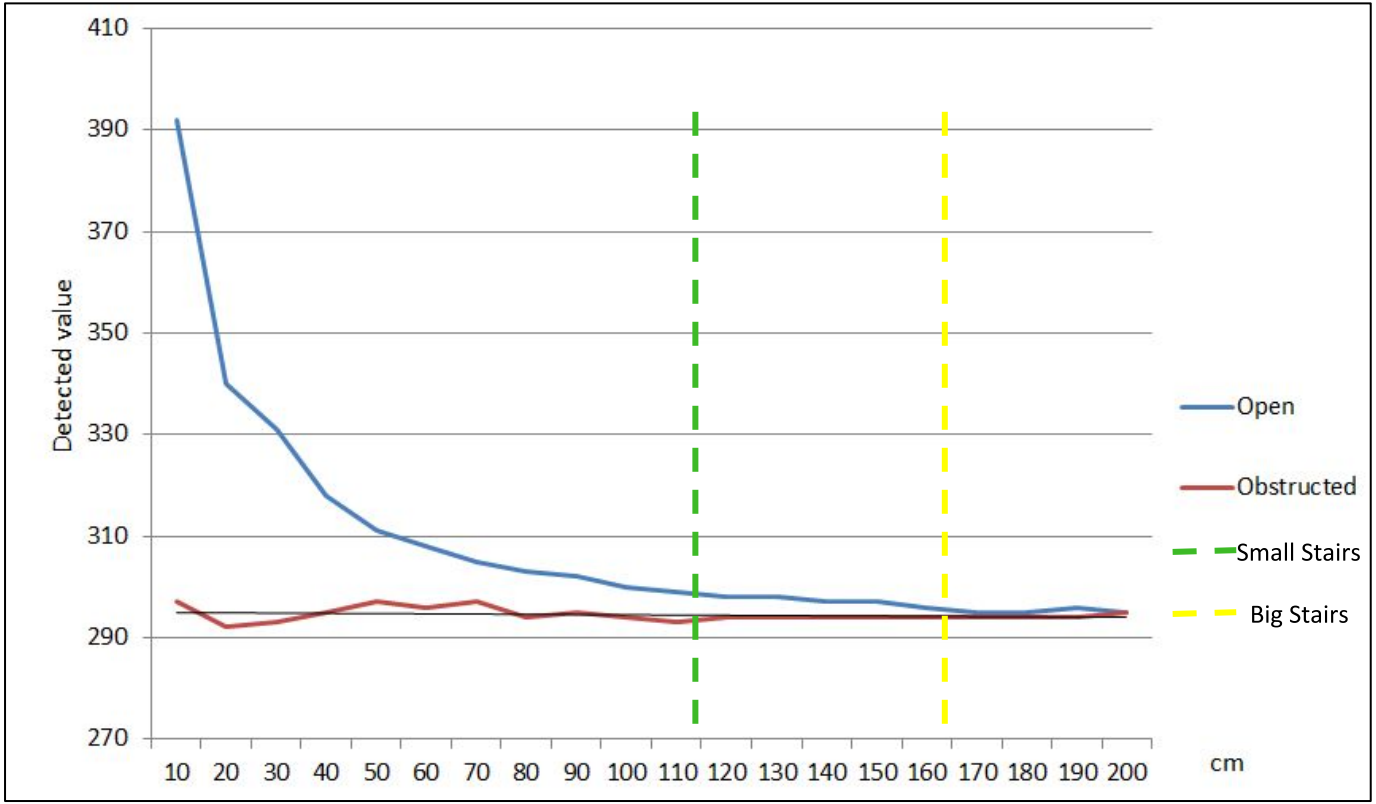




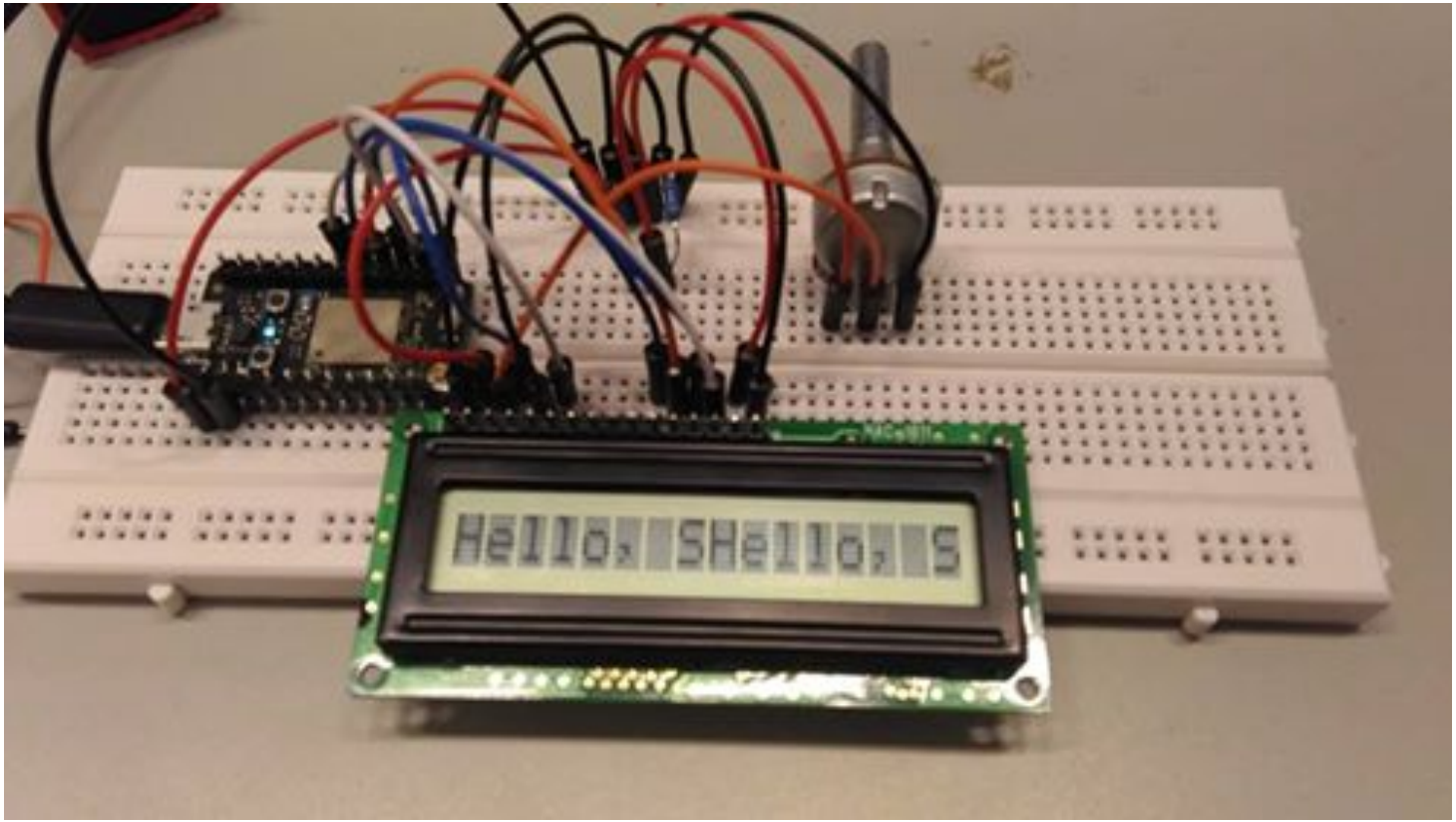
Testing


410
390
370
350
330
310
290
270
Detected value
10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200
cm
Open
Obstructed

Testing


410
390
370
350
330
310
290
270
Detected value
10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200
cm
Open
Obstructed
Small Stairs
Big Stairs

Testing



```
#include <MQTT.h>

int led0 = D1;
int infraredDetector = A1;
void callback(char* topic, byte* payload, unsigned int length);
MQTT client("iot.eclipse.org", 1883, callback);

void callback(char* topic, byte* payload, unsigned int length) {
    char p[length + 1];
    memcpy(p, payload, length);
    p[length] = NULL;

    Particle.publish("MQTT receive:", p);
}

void setup() {
  // MQTT code from: https://github.com/hirotakaster/MQTT
  // connect to the server(unique id by Time.now()) and subscribe
  client.connect("mf_" + String(Time.now()));
  if (client.isConnected()) {
      Particle.publish("client connected", "yes");
      client.subscribe("mf-status");
  }
}

void loop() {
  Particle.publish("Input value:", String(analogRead(infraredDetector)));
  // Publis the detected result to the Particle console every 5 seconds
   String detecting = String(analogRead(infraredDetector) > 300);
  if (client.isConnected()) {
      client.loop();
      client.publish("mf-status", detecting);
  }
   delay(5000);
}
```

Technical Challenges

- Distance to detect >150cm
- Configuring the photons
- Connecting the display
- MQTT between photons

Motifit

Alicja Kowalewska - José I. López - Bram Winter