

Title: know yourself and your surroundings to live BETTER

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## Motivation:

Nowadays, you can have multiple sensors on the environment around you. You can monitor your activity and heart rate with the help of smartphones and smartwatches.

WHY not use this information to help your living?

## Objective

This project aims to integrate several sensors and devices to better monitor what is happening around you and extract information that can help you. The project scenarios are open to discussion, but some possible examples follow:

- You usually use a bike to commute and want to be warned when pollution reaches some level, so you put on a mask or just moderate physical effort – it can worsen your comfort
- When you are stressed ( heart rate high ), you like to listen to music... why not make your room put some music without you needing to move a muscle?
- In the classroom, temperature and air quality affect all inside – you complained to the teacher, but you need hard proof – why not register it while collecting your and some of your colleagues' heart rate (the environment can change it) or your attention level ( video or IR camera )

## Challenge

integrate sensor, smartphone, smartwatch to explore and monitor specific scenarios that you will define with the help of your tutor. Using domotics frameworks such as Zigbee2MQTT (<https://www.zigbee2mqtt.io/>) and HomeAssistance ( <https://www.home-assistant.io/>) to make your integrated solution is an option.

## Starting point

We already have some off-the-shelf sensors and essential integration solutions available that allow integration of BLE and Zigbee with mobile or small devices such

as RPi or ESP32. You also have ESP32, RPI, and smartwatch ( need to confirm logistics if you select the project )

## Some devices ( more exist or can be acquired ):

<p><b>VINDSTYRKA</b> Air quality sensor, smart – From IKEA</p> <p><a href="https://www.ikea.com/pt/en/p/vindstyrka-air-quality-sensor-smart-00498231/">https://www.ikea.com/pt/en/p/vindstyrka-air-quality-sensor-smart-00498231/</a></p>	
<p><b>Xiaomi Higrómetro Sensor de Temperatura e Humidade C/2 Display - NUN4126GL</b></p> <p><a href="https://www.kuantokusta.pt/p/1984411/xiaomi-higro-metro-sensor-de-temperatura-e-humidade-c2-displ-ay-nun4126gl">https://www.kuantokusta.pt/p/1984411/xiaomi-higro-metro-sensor-de-temperatura-e-humidade-c2-displ-ay-nun4126gl</a></p>	
<p>Sonoff Zigbee 3.0 USB Dongle Plus (EFR32MG21)</p> <p><a href="https://www.zigbee2mqtt.io/devices/ZBDongle-E.html">https://www.zigbee2mqtt.io/devices/ZBDongle-E.html</a></p>	
<p>Far infrared thermal sensor array (32x24 RES) MLX90640 ( some models )</p> <p><a href="https://www.melexis.com/en/product/mlx90640/far-infrared-thermal-sensor-array">https://www.melexis.com/en/product/mlx90640/far-infrared-thermal-sensor-array</a></p>	
<p>Some options from <a href="https://www.zigbee2mqtt.io/supported-devices/">https://www.zigbee2mqtt.io/supported-devices/</a> depending on cost and on selected scenarios</p>	

Integrating or build solutions for monitoring is not out of the scope – there are open source solutions ( namely AirGradient ) that can be bough or just be an inspiration ( select sensors 😊 )

## **AirGradient ONE - Award Winning Indoor Monitor**

### **Indoor Air Quality Monitor**

The AirGradient ONE (Model I-9PSL) is an indoor air quality monitor enabling you to know if the air quality is healthy or not. It measures PM<sub>1</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>, CO<sub>2</sub>, TVOCs, NO<sub>x</sub>, Temperature and Humidity and has a built-in color LED bar and small display.

<https://www.airgradient.com/indoor/>

<https://www.airgradient.com/documentation/>

