Research Agenda for AirCase

1. Hardware Building

1.1 Sensors and MCU finished

1.2 Structure of Case

1.2.1 Design of a case finished

1.2.2 Structure of Airflow

The first version is ventilator with holes on the sides. Determinate the usability of this approach by

comparing it to

the sensors directly exposed to the air,

and the third one in charging

Possible method for further improvement:

better ventilator;

better structure;

better sensor positions

1.3 Power

1.3.1 where earphone case

1.3.2 capacity

Do experiment to see how long it can be used under one full charge.

normal use: listening to music, charge earphones, and running sensors;

running sensors only.

2. Software Building

2.1 MCU codes finished

2.2 APP for BLE finished

3. Signal Processing

3.1 Air Quality

3.1.1 which molecules are important finished

3.1.2 how to use these data

read papers

3.2 Scene Recognition

To distinguish Inside and outside pocket (backpack). Method is: to record some data in 4 situations:

|  |  |  |
| --- | --- | --- |
|  | In the darkness | In the brightness |
| Inside the pocket |  |  |
| Outside the pocket |  |  |

may be used signals:

rotate speed of ventilator

light strength

spectrum

3.3 Indoor Localization

existing methods: Bluetooth, WIFI, accelerometer (still need to read papers).

Our idea: localization without extra hardware. Spectrum maybe

Experiment

recording data for some different rooms. Using classifier to distinguish them.