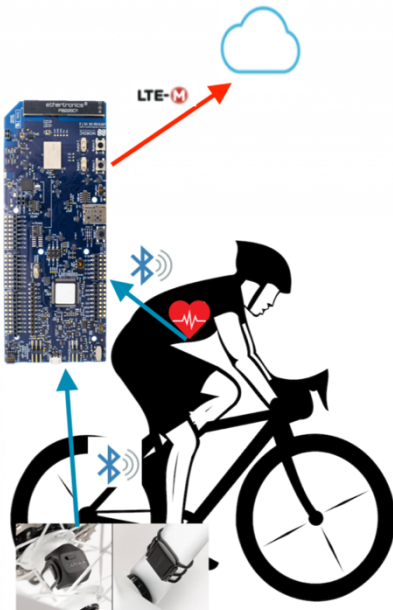


IoT bike gateway for Swiss Cycling



Graduate

Rossier Yoan

Objectives

Developing a tool tracking cyclist during short training segment. This tool will allow trainer to see metrics, from sensors on bike and on cyclist, in real time. So, he can give feedback right after the training segment.

Methods | Experiences | Results

To reach the goal, the nRF9160 DK from Nordic Semiconductor is used. This board allows collecting data from the sensors through Bluetooth. Then, the board can connect to the cellular network and send the collected data to the cloud. When data are in the cloud, a simple web server get them and insert them into a database (Influx DB). After data are in the database, the Grafana tool allows to see them as a graph. It's also possible to see the Grafana graphs from the web page. In order to synchronize data with the beginning and the end of the training segment, beacons are placed at the beginning and the end of the segment. With this, the beginning and the end of the segment can be seen on the graph.

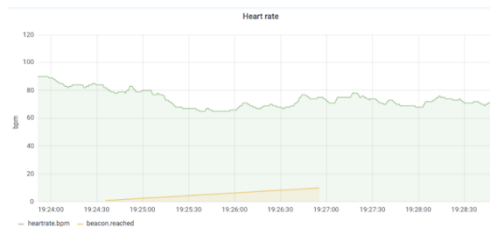
Bachelor's Thesis
| 2020 |

Degree programme
Systems Engineering

Field of application
Major Infotronics

Supervising professor
Rieder Medard
medard.rieder@hevs.ch

Partner
Swiss Cycling



Grafana graph of some collected metrics.

nRF9160 Cycling data

nRF9160 state : connected

Start beacon reached at : Thu Aug 13 2020 19:24:35 GMT+0200 (CEST), 399 ms

Stop beacon reached at : Thu Aug 13 2020 19:26:55 GMT+0200 (CEST), 128 ms

Heart Rate	Speed (rpm)	Cadence
bpm : 69	speed_rpm : 51	cadence_rpm : 82
timestamp : Thu Aug 13 2020 19:27:55 GMT+0200 (CEST), 998ms	timestamp : Thu Aug 13 2020 19:27:21 GMT+0200 (CEST), 933ms	timestamp : Thu Aug 13 2020 19:27:19 GMT+0200 (CEST), 412ms

Wheel diameter (in meters):

[Link to grafana dashboard.](#)

Simple web page to get data from MQTT broker.