This repository contains files that you will need to set up infant recordings as presented in the paper Ranta et al 2021

The term “NAPPA-RAP” comes from a combination of the name of our infant wearable “NAPping PAnts” coupled with a sensor firmware that records Respiration, Activity and body Position (RAP).

The full NAPPA-RAP system consists of the following components:

1-Movesense sensor with the NAPPA-RAP firmware

2-garment, such as NAPPA, used for holding the sensor in appropriate position

3-Datalogger App which you need in a mobile phone to start and configure the recordings, to stop the recording and to download the data from the sensor’s memory in the end of the recording.

Please note that a smartphone with Android version 9 or later is needed for successfully running the DataLogger App.

Note also that you will connect between smartphone and the sensor by using Bluetooth LE, which requires that you mush have activated both the BLE and GPS in the smartphone.

In order to upload the NAPPA-RAP firmware to your Movesense sensor, you will need the corresponding **Nappa-rap.zip** file (with or without bootloader we will discuss below). For updating the sensor firmware (“device firmware update”, DFU), you will need to get a sensor maintenance application, a.k.a. Movesense Showcase App from their open repository (<https://bitbucket.org/suunto/movesense-mobile-lib/downloads/>). The latest stable version is **1.9.11** (from January 2021). There is also an older App located in Google Play Store, version **1.9.5** (from December 2018). This DFU will have a clear procedure, just follow the instructions in the section “**Using Showcase app for DFU upgrade**” - <http://movesense.com/docs/esw/dfu_update/>

When do you need to upgrade sensor’s bootloader (with **Nappa-rap\_app\_bootloader.zip** file)? You can always use this one, but it is necessary at least if your Movesense sensor has not the latest firmware, it is necessary to update its bootloader. You can double check sensor’s firmware in the Movesense Showcase App (described above). In the Main menu select the button icon with lightning (entitled “Movesense”). Choose you sensor from the list of the sensors. When the connection is established, at the top of the screen, above menu items, you will see three text lines. Namely, Connected Device; Serial (your device serial number) and Sw version. The latest item is what we are looking for. If sw version equals to **2.0.0**, then it is entirely enough to upload the zip-file **without bootloader** (i.e. apply the **Nappa-rap\_app\_v1.\*.zip** file), because the sensor’s firmware is **up-to-date**. Otherwise, if, for example, there is a version 1.9.6, then it is necessary to apply **Nappa-rap\_app\_v1.\*\_bootloader.zip** file while updating process.