

Processor:

Android Nano

https://www.amazon.com/dp/B07RQ8S1LG?psc=1&ref=ppx_yo2_dt_b_product_details

Bluetooth:

HM-10 module

https://www.amazon.com/gp/product/B00WGPKZ8Y/ref=ppx_yo_dt_b_asin_title_o00_s00?ie=UTF8&psc=1

Instructions: <http://www.apploder.info/p/start-guide.html?m=1>

Other instructions:

<https://www.thinker-talk.com/post/bluecard-part-5-arduino-nano-bluetooth-module-how-to-at-09-or-hm-10>

Onbrand instructions:

https://www.fresnostate.edu/engineering/research/bulldogmote/documents/11.%20HM10%20BLE_FTDI.pdf

Accelerometer:

MMA8452Q

Instructions: <http://arduinolearning.com/code/arduino-and-mma8452-sensor-example.php>

Microphone:

SPW2430

Instructions: <https://www.aranacorp.com/en/using-a-microphone-with-arduino/>

Wiring reference:

<https://os.mbed.com/components/Adafruit-MEMS-Microphone-Breakout-SPW243/>

Arduino API

General BLE: <https://www.arduino.cc/en/Reference/ArduinoBLE>

RSSI: <https://www.arduino.cc/en/Reference/ArduinoBLEBLERSSI>

Research Paper on RSSI->Distance: <https://www.m.inf.tu-dresden.de/dargie/papers/icwcuca.pdf>

Filter: <https://stackoverflow.com/questions/36399927/distance-calculation-from-rssi-ble-android>

Just Distance:

<https://stackoverflow.com/questions/22784516/estimating-beacon-proximity-distance-based-on-rssi-bluetooth-le>

TxPower: To answer on how to get txPower, "(...)" and A [or txPower] is a reference received signal strength in dBm (the RSSI value measured when the separation distance between the receiver and the transmitter is one meter). -also in the paper

Kalman Explanation: <https://www.bzarg.com/p/how-a-kalman-filter-works-in-pictures/>

RSSI w Accelerometer! - Kalman: <http://worldcomp-proceedings.com/proc/p2016/ESC6026.pdf>

To calibrate RSSI measurements, we need to calculate A and n for the environment. We collected RSSI values by moving the mobile node over a 10 m distance in steps of 0.5m.

We obtained the average RSSI value at the mobile node, for

each step, using 100 samples, from each anchor node