# WearLoc

## A Wearable Indoor Localization Device


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## RPLIDAR

**360° omnidirectional laser scanner**

**Scan range 0.2 ~ 6m**

**Angular resolution: 1°**

**Distance resolution: 1%**

## Hokuyo URG-04LX

**240° laser scanner**

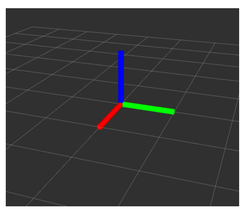
**Scan range 0.02 ~ 4m**

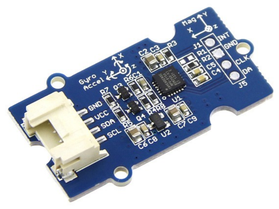
**Angular resolution: 0.34°**

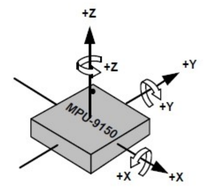
**Distance resolution: 1%**

## Grove IMU 9DOF v2.0

**The IMU is used to get the orientation of the laser scanner.**

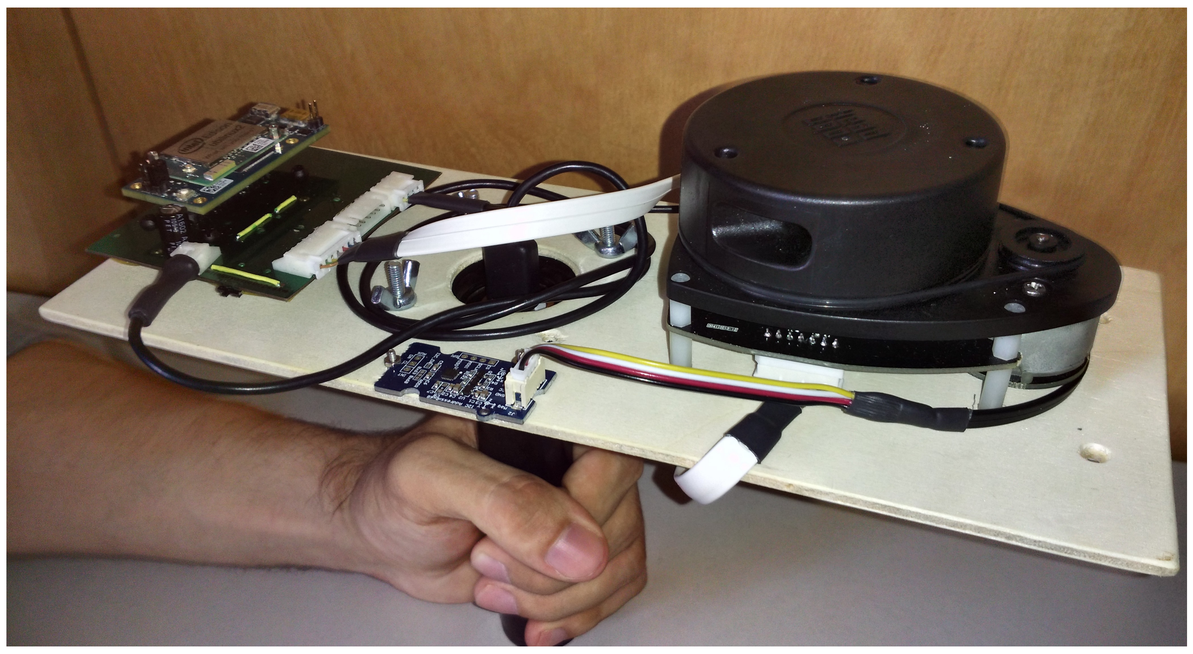


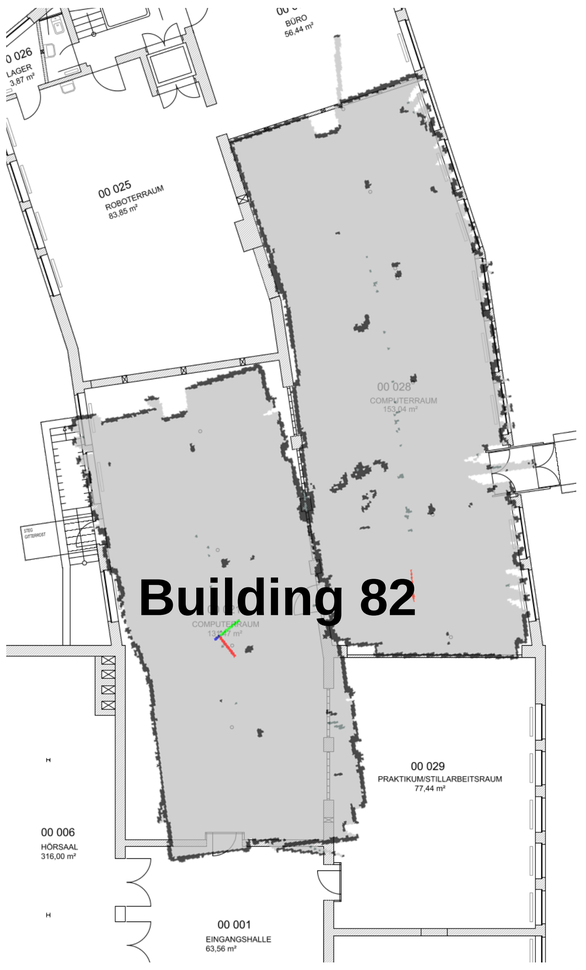


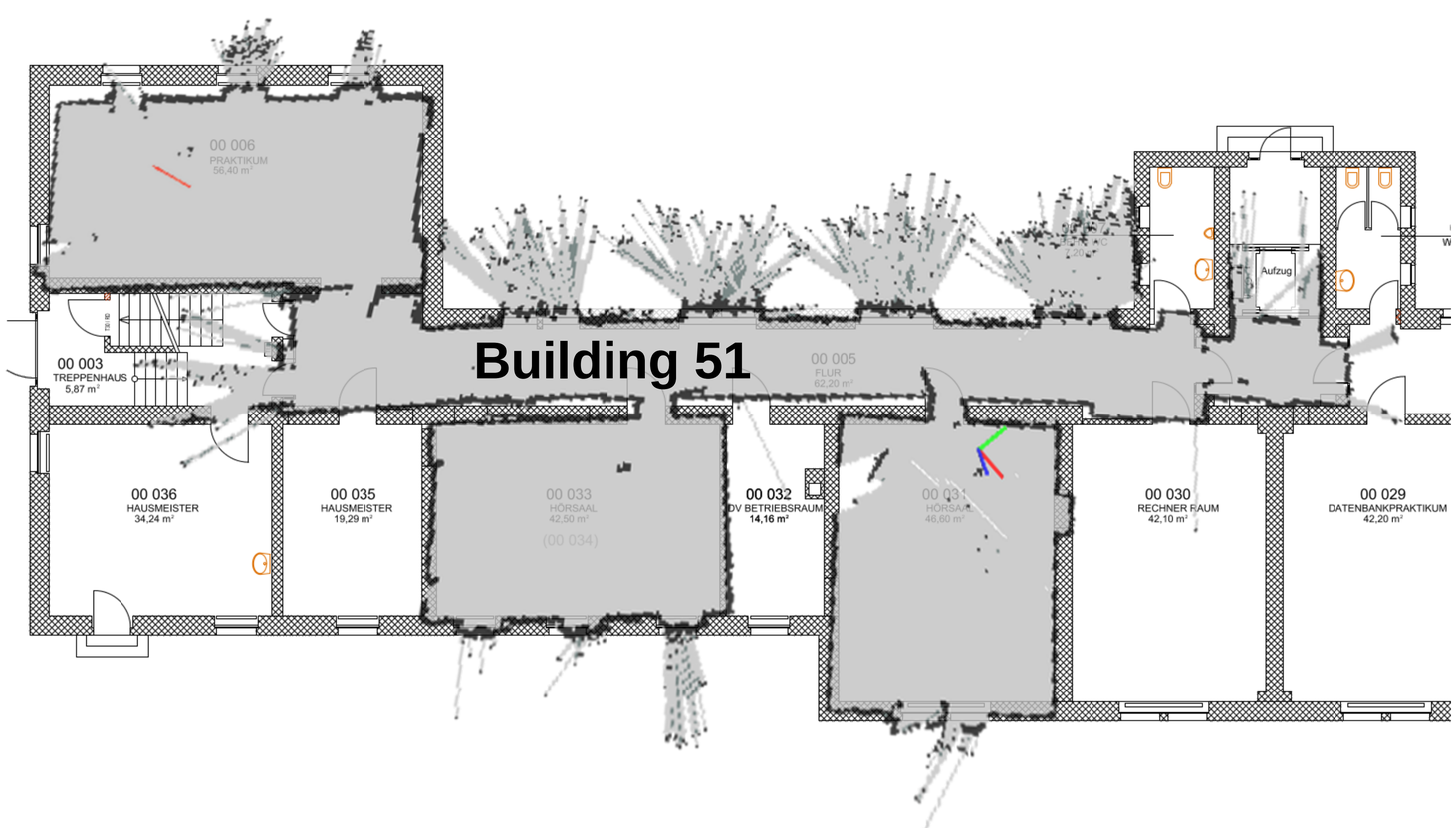



## Intel Edison / Raspberry Pi Model 2B

**The Intel Edison / Raspberry Pi is used to collect laser scans and IMU data which can be live or subsequent processed on a laptop running a SLAM implementation in ROS resulting in a map of the environment and a trajectory.**




## Area of application

### Indoor Mapping:

**The main application area of cartography in robotics is indoor mapping. It is possible to transfer Simultaneous Localization and Mapping (SLAM) from robotics to the field of wearable devices for humans using a laser range sensor and a 3-axis gyroscope, 3-axis accelerometer and 3-axis magnetometer.**

### Cave Exploration:

**Another application is cartography of caves. Our wearable would enable a Speleologist to get accurate data about the size of a cave. Even areas which are difficult to access can be mapped on the fly by wearing the device.**

### Search & Rescue:

**This device could be used in search and rescue type situations. In such scenarios the rescue team would be able to map the desired areas. Obstructed paths due to possible debris can be marked as such. Thus it is possible to find the best route to the intended destination. Here, best could mean the quickest or the safest route, depending on the given environment.**

**Project based on Hector SLAM by Team Hector TU Darmstadt.**