Zurich University
of Applied Sciences

School of
Engineering

InES Institute of
Embedded Systems

Echtzeit-Positionstracker mit LoRa

The bachelor thesis is an advancement of the preceding project thesis "Zieleinlauferkennung für Segelschiffe an einer Regatta". In context of this bachelor thesis the topic has been generalized to use the system also in other areas of application. For example, in different outdoor sports it would be an advantage to know the geographic position of participants or objects in a defined area. By using a GPS module and a radio transmitter, it would be possible to transmit the position data to a central receiving station, where it could be processed and visualized. The bachelor thesis contains all parts of the development. It starts with the elaboration of suitable solutions, about the development of the hard and software components up to the tests of the whole system.
The developed position tracker with integrated GPS and radio module transmits its position data frequently with the energy efficient LoRa radio standard in the 868 MHz frequency band. The central station receives the position data of all the trackers and transfers them over an USB interface to the connected computer. The developed computer software processes the received position data and shows them on the user interface. Additional it is possible to retrace the course of each participant on a map. Moreover, the software allows to configure the log interval of the tracker individually. The software also includes a detection algorithm for determining when objects are crossing a user defined finish line. The results of the detection algorithm and all received positions will be saved in a file.
The results of the field tests had shown that the required functionality is fulfilled for the whole system. The system achieved a radio transmission range of 2600 meters in free space.

Diplomierende
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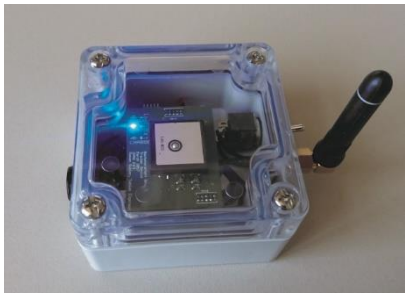
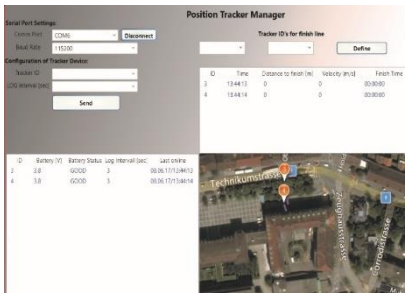


Position Tracker



Computer Software