

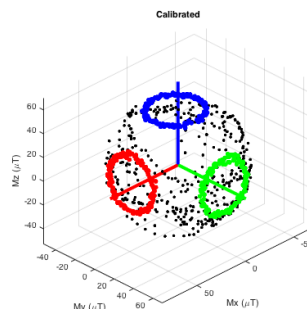
Evaluation of the influences of calibrated and uncalibrated data from a Magnetometer on a sensor fusion algorithm

Description

Using sensor fusion with data from gyroscopes, accelerometers and magnetometers it is possible to determine the absolute orientation of the sensor. The absolute orientation shows the orientation of a device relative to the North Pole. Said orientation is used for navigation or multiple other applications. However the data from a magnetometer is very prone to magnetic disturbances and needs to be calibrated thoroughly and repeatedly to receive meaningful results.

We want to evaluate the quality of difference sensor fusion algorithms using data from magnetometers alongside gyroscopes and accelerometers and therefore need to do a proper calibration of the magnetometer data.

Your tasks in this project would be the first get familiar with the used sensor fusion, magnetometers and magnetic disturbances. Afterwards you will show the influence of the magnetometer data on the fusion and find and implement a method to calibrate the data from the magnetometer. Afterwards a comparison for the sensor fusion between calibrated and uncalibrated sensor data should be conducted.



The following tasks have to be conducted:

- Familiarize with the fusion method, inertial sensor data and magnetic disturbances
- Evaluate the influence of magnetic disturbances on the result of the sensor fusion
- Implement a method to calibrate the data from the magnetometer and compare the results of the sensor fusion from calibrated and uncalibrated magnetometer data
- Discussion and documentation of the results

Prerequisites:

- Experience with Inertial Sensors and Sensor Fusion
- Programming skills preferably in MatLab or Python to test the fusion methods and implement the calibration

Supervisor:

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