Data Description

Overview

The structure of the dataset is indicated by Fig. 1, which contains two tests. For each test, the body-IMU (the IMU placed on the vehicle body) data, the Wheel-IMU (the IMU mounted on the vehicle wheel center) data, the odometer data and the pose ground truth are provided. The IMU used in our experiments contains four ICM20602[1] chips. The unit of gyroscope data is rad/s, and the unit of accelerometer data is m/s^2.

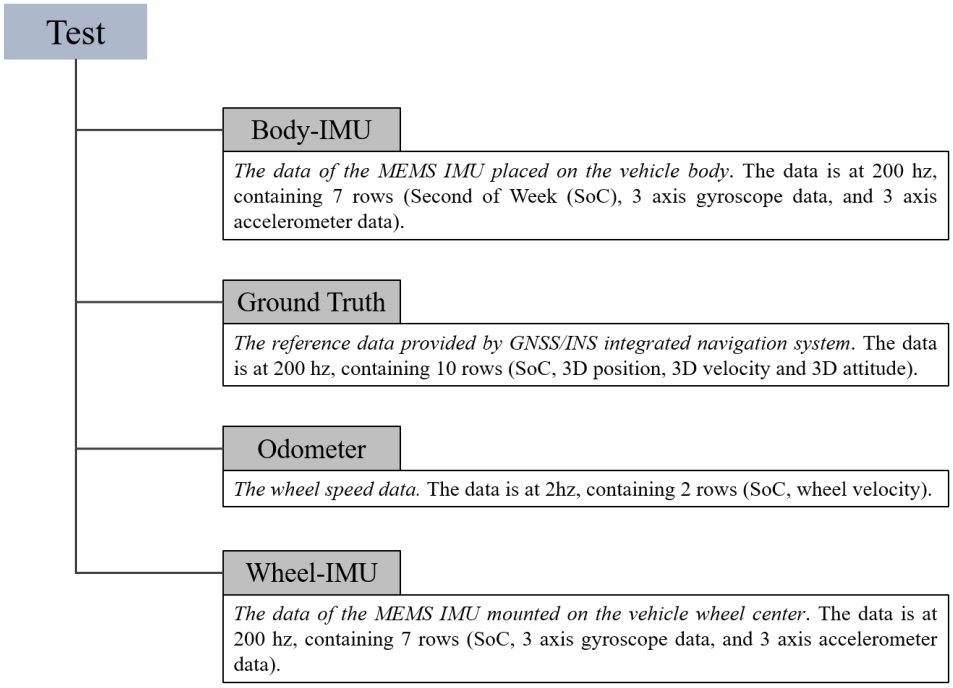


Fig. 1 Dataset structure.

Experimental Platforms and Environments

The vehicle used in Test 1 was a typical differential wheeled robot—Pioneer 3DX[2], as shown in Fig. 2. The test was conducted in the Information Department of Wuhan University. The robot moved on a T-shaped trajectory about five times, as shown in Fig. 3.

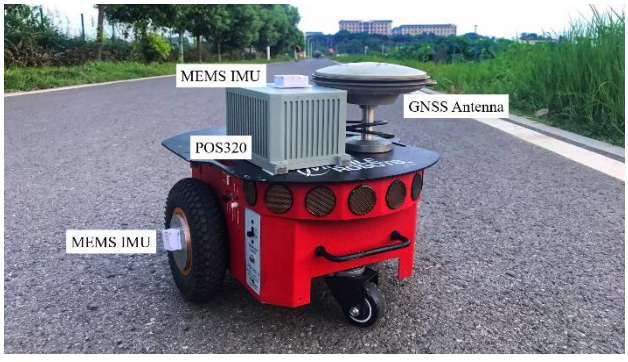


Fig. 2 The robot used in Test 1.

[1] TDK InvenSense https://invensense.tdk.com/products/motion-tracking/6-axis/icm-20602/
[2] Adept MobileRobots https://www.generationrobots.com/media/Pioneer3DX-P3DX-RevA.pdf

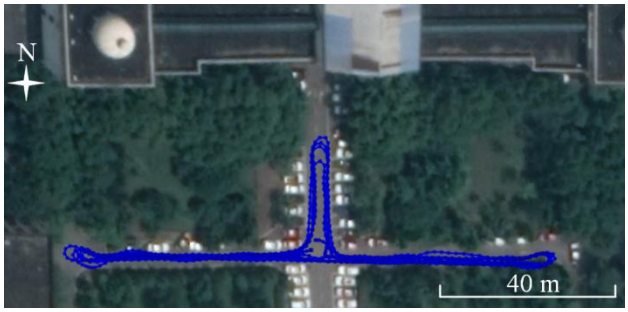


Fig. 3 The experimental trajectory in Test 1.

The vehicle used in Test 2 was an ordinary SUV, as shown in Fig. 4. The test was conducted on the whole campus of Wuhan University. The car moved around the campus for about two times, as shown in Fig. 5.

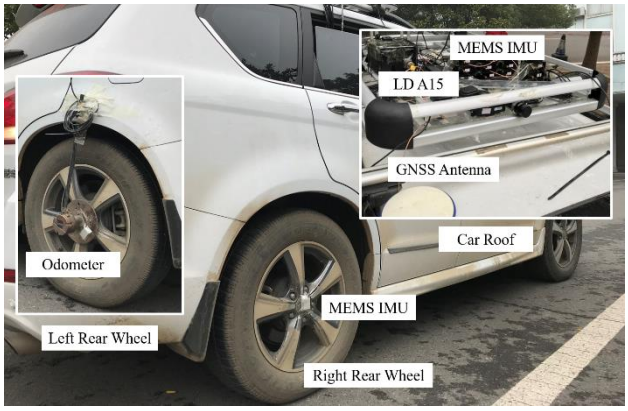


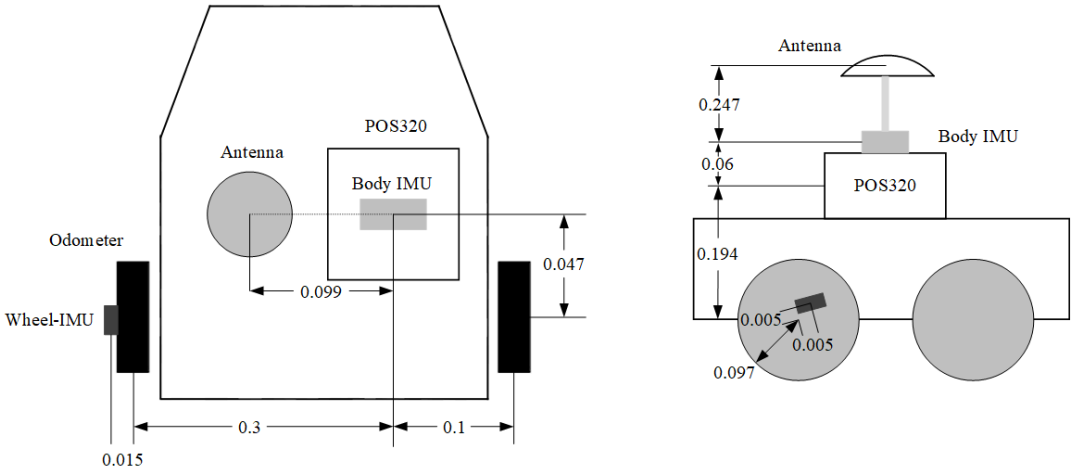
Fig. 4 The car used in Test 2

Fig. 5 The experimental trajectory in Test 2.

Parameters

The devices installation relationship in the two tests are shown in Fig. 6 and Fig. 7, respectively. Please refer to the configure file in the source code for more parameters.

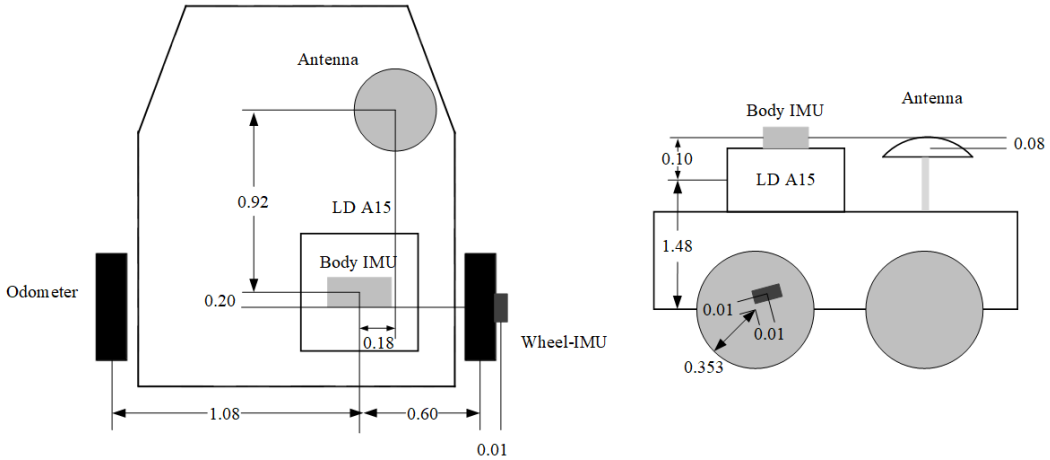
Unit: m



Top View Side View

Fig. 6 The devices installation relationship in Test 1.

Unit: m



Top View Side View

Fig. 7 The devices installation relationship in Test 2.

Others

To avoid possible legal and security issues, a constant bias has been added to the reference latitude and longitude, however, it makes no difference to the algorithm evaluation and analysis.

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