

Precise Position Determination and Generation of Top-Actual Maps with ANavS Multi-Sensor RTK Module

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SUMMARY

Autonomous vehicles, robots and aerial vehicles require a precise and reliable positioning system with sensors of small size, low weight and low-costs.

This paper describes the ANavS multi-sensor RTK module, that is equipped with up to 3 Multi-frequency, Multi-GNSS receivers, an industrial-grade MEMS IMU, a barometer, a processor for the tightly coupled sensor fusion, and numerous interfaces including USB, Ethernet and CAN bus for the connection of odometry and camera data. The sensor fusion uses a Kalman filter that tracks the position, velocity, acceleration, attitude, angular rates, IMU biases and bearing vectors from the camera to the feature points.

The ANavS Multi-Sensor RTK positioning has been evaluated in a challenging environment in Vietnam, Hanoi in cooperation with the NAVIS center. The measurement results show that an accurate and seamless position information was obtained also close to skyscrapers and below bridges.

The precise position and visual information could be used to generate accurate maps or to update the existing maps that are often not very accurate.