



## **Accurate Attitude Estimation of Low-Accelerating Vehicles by the Use of Multiple Low Cost MEMS-Based IMUs**

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### **Abstract**

Inertial sensors and inertial measurement units (IMUs) are widely used in navigation support systems, autonomous vehicle navigation, and vehicle motion control process. Inertial measurement based attitude determination and navigation systems are capable of sustaining their accurate operation with high resolution without subjecting to external jamming and noise conditions. The most vital equipment in inertial measurement system is the IMU. The required degree of accuracy, resolution and repeatability in angular velocities and accelerations mainly depend on the implementation technology of the gyroscopes and accelerometers. The paper presents a methodical approach to obtain better attitude determination for vehicles with low-cost, multiple MEMS-based IMU. The simulated results are based on the mathematical models of MEMS-based gyroscopes and accelerometers.