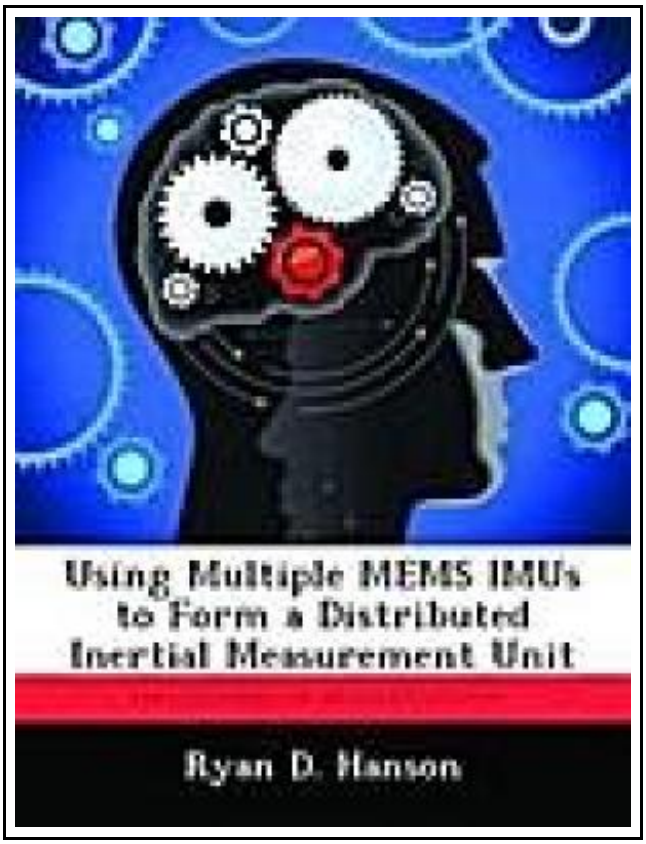
Using Multiple MEMS IMUs to Form a Distributed Inertial Measurement Unit



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Reviews

It is simple in read easier to understand. I am quite late in start reading this one, but better then never. Its been designed in an exceptionally easy way in fact it is just following i finished reading through this publication where basically transformed me, alter the way i really believe.

(Ms. Christy Ondricka DDS)

USING MULTIPLE MEMS IMUS TO FORM A DISTRIBUTED INERTIAL MEASUREMENT UNIT

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Biblioscholar Okt 2012, 2012. Taschenbuch. Book Condition: Neu. 246x189x6 mm. This item is printed on demand - Print on Demand Neuware - MEMS IMUs are readily available in quantity and have extraordinary advantages over conventional IMUs in size, weight, cost, and power consumption. However, the poor performance of MEMS IMUs limits their use in more demanding military applications. It is desired to use multiple distributed MEMS IMUs to simulate the performance of a single, more costly IMU, using the theory behind Gyro-Free IMUs. A Gyro-Free IMU (GF-IMU) uses a configuration of accelerometers only to measure the three accelerations and three angular rotations of a rigid body in 3-D space. Theoretically, almost any configuration of six distributed accelerometers yields sufficient measurements to solve for the translational and angular acceleration. In reality, however, sensor noise corrupts the measurements and good sensor geometry is necessary to obtain an accurate estimate of the translational and angular accelerations. Determining the optimal configuration of accelerometers is an exercise in geometry. This thesis investigates the optimal geometry of an INS constructed of multiple networked IMUs and develops the accompanying mechanization and error equations. Simple simulations are run to test and validate the basic design principles. 108 pp. Englisch.

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