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Use of Earths Magnetic Field for Pedestrian Navigation

By Muhammad Haris Afzal

LAP LAMBERT Academic Publishing. Paperback. Book Condition: New. Paperback. 216 pages. Dimensions: 8.7in. x 5.9in. x 0.5in. With advances in sensor technology and the inclusion of low cost consumer grade sensors in portable systems like smart-phones, pedestrian navigation using such devices has become a reality. With consumer grade sensors comes a Pandoras Box full of errors rendering the unaided navigation solution with these sensors of limited use. A significant contribution to the overall navigation error budget associated with pedestrian navigation is accurate attitude estimation. This research develops different sensor fusion techniques to utilize the Earths magnetic field for attitude and rate gyroscope error estimation in pedestrian navigation environments where it is assumed that GNSS is denied. A novel Quasi-Static magnetic Field (QSF) based attitude and angular rate error estimation technique is developed to effectively use magnetic measurements in highly perturbed environments. This technique is used with the proposed Extended Kalman Filter (EKF) based attitude estimator for hand-held devices. Results indicate that the proposed algorithms effectively estimate attitude and gyroscope errors, reducing the overall navigation error budget by over 80 in the urban and indoor environments. This item ships from multiple locations. Your book may arrive from Roseburg,OR, La Vergne,TN. Paperback.



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