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CONDITION MONITORING AND INFORMATION MANAGEMENT FOR SKEW REDUNDANT
STRAPDOWN INERTIAL MEASUREMENT UNIT

Abstract

This paper presents two methods for condition monitoring and information management in skew strapdown inertial measurement unit based on two strategies. Information management includes fault detection, isolation and reconfiguration. First, Considering the error coefficients of gyros, a unified model is built for redundancy configuration. Then, The strategy related with the accuracy and reliability is investigated. One approach called Intersection fusion model is proposed which can reconfigure quickly with index. The other approach is based on Parity equation check. The residual which can be used as evaluation of sensors is analyzed by time series analysis and Kalman filter. Unscented Kalman filter is used to monitor the error coefficients of gyros online. The simulation with configuration of 5 gyros verifies that two proposed approaches have a strong adaptability and high precision.