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APPLICATION OF ITERATIVE FILTERING AND REVERSE-SMOOTH ALGORITHM IN POS OF HIGH RESOLUTION EARTH OBSERVATION SYSTEM

Abstract

POS(position and orientation system) provides continued and high frequency position and orientation for high revolution earth observation load,the accuracy of which determines imaging effect of load. To improve the precision of position and orientation of POS in use of high-revolution earth observation system,a novel iterative filtering and reverse-smooth algorithm was proposed and the flowchart was designed.To evaluate the validity of the proposed method,a POS was developed based on FOG and flexible quartz accelermeter. The simulation and airborne test show that when using the algorithm to post process the IMU and GPS raw data,it is possible to achieve an accuracy of 10cm(RMS) in 3D position,it is also seen that the roll and pitch accuracy is superior to 0.005,the heading accuracy is superior to 0.007.The test results show that the proposed method can effectively improve the position and orientation accuracy of POS.Finally,comments are made regarding the application of this method in high revolution earth observation system.