The study of high precision assistant navigation system with micro-magnetic sensors

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Abstract: Low-cost MEMS sensors often suffer from inaccuracy and are influenced greatly by temperature variation, and the orientation error is cumulate with time. The GPS can provide long term stability with high accuracy, but it has its insufficiencies, such as disturbed easy, lower data updating rate and so on, it is hard to meet the demand of real-time measuring. The micro-magnetic sensors, an independence precision tool, can offer real-time yaw attitude angle, and this can correct the orientation cumulate error, and it increase the independence in flight of the UAV. Based on analyzing the selection principles of testing sensor, comparing 3 kinds micro-magnetic sensors, the GMI magnetic sensor is best to test geomagnetic field. The Regional model of geomagnetic field is built, and a GMI-magnetic sensor navigation method is put forward. Three-axis magnetic sensor measure the geomagnetic field, and it is matching with the geomagnetic map, then the geomagnetic elements on currently position are knew, combining with the information of accelerometer, the position information can be gotten by matching algorithm.

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