Trajectory Reconstruction based on Inertial Navigation System

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In an unknown area where the signal is shielded. Celestial Navigation System (CNS) will not apply. So the authors hope to design a navigation device which avoids delivery of external signal or navigation map database. The device uses MPU-9250 to collect the acceleration and angular velocity data. Then do integral and matrix calculation of the data by Arduino. And process the noise using Kalman filtering, by which the errors would be reduced. After that, input data into MATLAB software and draw 3D images to reproduce trajectory. Thus, the inertial navigation system which is not dependent on the external signal has a great advantage in such environments. This project can measure deflection angle accurately. It can obtain 3D trajectory in a varied topography, and the trajectory is the same with the actual path. Conclusion: In the absence of any satellite signal, the system can provide a reference for human motion trajectory representation.

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