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论文

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Kalman滤波器在直升机盘旋飞行中的应用

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Application of Kalman Filter to Circled Flight of Helicopter

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摘要

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摘要 介绍了一种针对无人驾驶直升机小半径稳速盘旋使用的Kalman 滤波器, 并用其进行数据处理, 同时给出了无人驾驶直升机盘旋飞行的状态方程, 以及进入盘旋、退出盘旋和野值数据的自动判断和处理, 并且在分析过程中给出了误差分析。讨论了飞行模式检测方法的设计思路及关键技术, 并给出了本方法的虚警概率。本方法可用于导航控制、天线跟踪和遥测数据处理等系统中, 可以提高定位的准确性, 并进行飞行模式的自动判决。

关键词: Kalman滤波器 盘旋 模式判决 野值剔除

Abstract: This paper discussed a kind of Kalman filter used in the pilotless helicopter hovering flight with small radius and stable velocity. The authors put forward state equations of this flight mode, the auto-judging method at entrance or exit of the hovering flight mode, and the auto-processing method on outlier data rejection. This paper gives the error analysis on data process and false alarm probability of flight mode judgment using the filter. This filter can be used in navigation, antenna tracking, and telemetry data processing systems to improve the locating accuracy and to realize the flight mode auto judgment.

Keywords: Kalman filter circle flight mode judgment outlier rejection

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