论文与报告

固定区间平滑新算法及其在飞行试验中的应用

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摘要
本文根据Kalman滤波和Rauch-Tung-Striebel固定区间平滑公式,提出了信息滤波-- 固定区间平滑的新算法,并给出了算法的U-D分解形式.由于改变了算法结构,使整个算法的数值稳定性好、可靠性高,而且平滑算法计算量和平滑所需滤波计算量均大为减少.计算量分析结果表明,新算法与Bierman序列滤波和固定区间平滑算法.Keigo. Watanabe前向平滑方法相比较,计算量减少40%以上;当状态转移阵中各元素用K的函数表示时,计算量减少50% 以上.本文将此平滑算法用于实际飞机飞行试验的数据处理中,得到了令人满意的结果.

关键词　[Kalman滤波](#)　[固定区间平滑](#)　[状态估计](#)　[数值稳定性](#)　[飞行试验](#)

分类号

A New Algorithm of Fixed-Interval Smoother and its Application to Flight Test

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Abstract
In this paper, a new information filter and fixed-interval smoother algorithms based on Kalman filter and Rauch-Tung-Striebel smoother are presented, and U-D factorization is used both in the new filter and smoother to get high computational efficiency. These new algorithms exhibit excellent numerical accuracy and stability and the number of operations of both the filter and smoother are decreased greatly since the structures of the new estimators are rearranged. Comparison of operation numbers shows that the new information filter and fixed-interval smoother is more than 1.7 times as fast as Bierman's sequential smoother and Keigo. Watanabe's forward-pass smoother.

Key words　[Kalman filter](#)　[fixed-interval smoother](#)　[state estimation](#)　[numerical accuracy](#)　[flight test](#)

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