应用

# 基于TI-UKF的短航迹在线空间配准方法

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摘要：

为了提高多传感器系统的综合性能，对时空配准的理论和方法进行探索具有重大的现实意义。近程跟踪定位系统中，由于目标距离近且速度快，导致可用于配准的数据量很小，航迹短，在配准算法尚未收敛时观测数据已结束，从而为多传感器的时空配准带来困难。本文针对近程跟踪定位系统中的这些特征，将航迹迭代的思想结合近程系统航迹较短的特点，提出一种基于航迹迭代的无迹卡尔曼滤波(TI-UKF)的空间配准方法，对以雷达和红外传感器为探测手段获取的目标数据实现空间配准。实验采用曲线运动模型，模拟4条航迹，对雷达和红外传感器的空间配准进行实验，验证本文所提算法的有效性和系统偏差的收敛速度。实验结果表明，所提算法是有效的，且具有较强的应用价值。

关键词： 无迹滤波　空间配准　航迹迭代

# Online Spatial Alignment for Short Tracks Based on TI-UKF

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Abstract:

In order to enhance the integrated performance of multi-sensor multi-target tracking system, it is extreme important to study on the theory and method of spatial alignment. For tracking and location system in short range, it is very difficult for spatial alignment of multi-sensor because of the fast velocity, short data and short track. It often happens that the measurement data has been over before the convergence of the spatial alignment process. This paper proposes a new method, in which the track iteration is employed to solve the difficulty brought by short track. The proposed method links a few short tracks together, and keeps system biases changeless for several points. Based on the above, the proposed method improves the UKF(Unscented Kalman Filter) algorithm properly to complete the spatial alignment algorithm in the short-range system formed by radar and infrared sensors. In computer simulation, four tracks are set up according to proper curve moving model, which is used to validate the efficiency of the proposed method and the convergent performance of system biase. To sum it up, the performance of the improved UKF, TI_UKF is better than the improved EKF.

Keywords: Unsented Kalman Filter　spatial alignment　track iteration

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