

论文

## 基于UKF的单站无源定位与跟踪算法

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摘要

单站无源定位与跟踪系统观测方程的非线性性决定了定位与跟踪中必须采用非线性滤波技术。MGEKF等非线性滤波方法本质上都属于扩展卡尔曼滤波算法，都存在由于线性化误差而导致滤波器稳定性差等问题。基于unscented变换的UKF算法不在线性化误差，具有更好的稳定性，但由于协方差估计不足，导致收敛速度较慢。该文基于UKF算法提出了一种迭代UKF(IUKF)算法，通过对状态和协方差的迭代估计，改善了UKF协方差估计不足的问题。仿真结果表明在不同的参数测量精度条件下，IUKF算法既保持了较好的稳定性又提高了算法的跟踪精度和收敛速度。

关键词 [UKF](#); [无源定位](#); [卡尔曼滤波](#); [迭代](#)

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## An Algorithm Based on UKF for Single Observer Passive Location and Tracking

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Abstract

Nonlinear filtering algorithms must be applied to single observer passive location and tracking system for the nonlinearity of its observation equations. MGEKF and other nonlinear filters are belong to EKF in essence, while the EKF-like algorithms share the disadvantage of linearization reduce to the unstability of filters. The filter, based on unscented transformation is named UKF, does not need linearization and shows robustness strongly; however, the convergence of UKF is poor for its underestimation of true covariance. An iterated UKF algorithm is developed, and the estimation to the covariance of filter is improved by iterating estimation. Simulation results demonstrate the tracking performance of this algorithm in different conditions.

Key words [Unscented Kalman filter](#) [Passive location](#) [Kalman filtering](#) [Iteration](#)

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