

航天电子技术

抗“飞点”的UKF GMPCPHD滤波算法

黄伟平¹, 徐毓¹, 甘少武²

1. 空军雷达学院科研部, 湖北 武汉 430019
2. 空军雷达学院训练部, 湖北 武汉 430019

摘要:

为实现被动测角目标状态和数目的实时估计, 在高斯混合粒子(Gaussian mixture particle, GMP)的势化概率假设密度(cardinalized probability hypothesis density, CPHD)滤波框架下, 提出了基于抗“飞点”无迹卡尔曼滤波器(unscented Kalman filter, UKF)的GMPCPHD滤波算法, 即抗“飞点”的UKF GMPCPHD滤波算法。在该算法中, 粒子滤波的重要性采样函数由抗“飞点”UKF产生, 粒子的预测与更新采用拟蒙特卡罗(quasi Monte Carlo, QMC)方式, 目标状态的概率假设密度(probability hypothesis density, PHD)和势分布用一组高斯粒子滤波器(Gaussian particle filtering, GPF)近似。通过该算法与GMPCPHD、UKF-GMPPHD滤波算法的对比仿真, 验证了该算法良好的跟踪性能。

关键词: 非线性跟踪 目标数目 势化概率假设密度 门限函数 拟蒙特卡罗

New UKF-GMPCPHD algorithm for outliers' rejection

HUANG Wei ping¹, XU Yu¹, GAN Shao wu²

1. Department for Scientific Research, Air Force Radar Academy, Wuhan 430019, China;
2. Department for Training, Air Force Radar Academy, Wuhan 430019, China

Abstract:

To get the state and number estimation of the bearings only targets in real time, employing the frame of a cardinalized probability hypothesis density (CPHD) for the Gaussian mixture particle (GMP), a GMPCPHD algorithm based on unscented Kalman filter (UKF) for outliers' rejection, called UKF-GMPCPHD algorithm for outliers' rejection, is proposed. In the new algorithm, the sophisticated proposal distributions for the particle filter are generated by the UKF for outliers' rejection, and the prediction and update distributions for the particles are approached by quasi Monte Carlo (QMC) method, and the probability hypothesis density (PHD) and cardinalized distributions are approximated by a mixture of Gaussian particle filtering (GPF). Finally, the comparison has been done among the UKF-GMPCPHD, GMPCPHD and UKF-GMPPHD. Simulation results show the good tracking performance of the proposed algorithm.

Keywords: nonlinear track target number cardinalized probability hypothesis density (CPHD) threshold function quasi Monte Carlo (QMC)

收稿日期 修回日期 网络版发布日期

DOI: 10.3969/j.issn.1001-506X.2012.01.07

基金项目:

通讯作者:

作者简介:

作者Email:

参考文献:

本刊中的类似文章

扩展功能

本文信息

- Supporting info
- PDF(1466KB)
- [HTML全文]
- 参考文献[PDF]
- 参考文献

服务与反馈

- 把本文推荐给朋友
- 加入我的书架
- 加入引用管理器
- 引用本文
- Email Alert
- 文章反馈
- 浏览反馈信息

本文关键词相关文章

- 非线性跟踪
- 目标数目
- 势化概率假设密度
- 门限函数
- 拟蒙特卡罗

本文作者相关文章

PubMed