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基于MLR的机动平台传感器误差配准算法

崔亚奇, 熊伟, 何友

海军航空工程学院 信息融合研究所, 山东 烟台 264001

Mobile Platform Sensor Registration Algorithm Based on MLR

CUI Yaqi, XIONG Wei, HE You

Research Institute of Information Fusion, Naval Aeronautical and Astronautical University, Yantai 264001, China

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摘要 基于固定平台传感器误差极大似然配准(MLR)算法,针对机动平台存在姿态角系统误差的问题,提出了对机动平台传感器系统误差和目标状态进行批处理离线估计的机动极大似然配准(MLRM)算法.该算法利用所有传感器对目标的量测值,通过把传感器量测向目标状态进行投影、对传感器系统误差和目标状态进行期望最大化迭代以及对目标的状态进行融合估计,最终实现量测、姿态角系统误差和目标状态的有效估计.仿真结果表明,该算法迭代收敛速度快,对系统误差估计精度高,对系统误差可观测性较低的配准环境的适应性强并且对传感器姿态角的相关性不敏感,具有很强的工程实用性.

关键词: 机动平台 MLR算法 误差配准 融合估计 传感器网络

Abstract: A maximum likelihood registration of mobile sensor (MLRM) algorithm is proposed in this paper to estimate sensor bias and target state off-line, and it is capable of batch processing. This algorithm is based on the maximum likelihood registration (MLR) algorithm for fixed platform sensor registration and aimed at solving the issue of attitude angle bias that exists in a mobile platform. The MLRM algorithm realizes effective estimate of measurement, attitude angle bias and target state by projection sensor measurements onto target state space, iteration of the maximizing expectation of sensor bias and target state and fusion target state estimation using the measurements from all sensors. The simulation result shows that the algorithm has fast convergence rate, high estimate precision of sensor bias and strong adaptability to low observability environment of bias, insensitivity to correlation between attitude and strong engineering practicability.

Keywords: mobile platform MLR algorithm bias registration fusion estimation sensor networks

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Corresponding Authors: 何友 Email: xiongweimail@tom.com

About author: 崔亚奇 男,博士研究生.主要研究方向: 误差配准、雷达数据处理、系统仿真. Tel: 0535-6635263 E-mail: cui_yaqi@126.com

何友 男,教授,博士生导师.主要研究方向: 信息融合,信号检测及其在军事信息系统中的运用. Tel: 0535-6635263 E-mail: xiongweimail@tom.com

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