[1]吴志峰,吴 军,王 蕊.基于双联邦UKF算法的组合 导航数据融合方法[J].弹箭与制导学报,2009,5:106.

WU Zhifeng,WU Jun,WANG Rui.Integrated Navigation Data Fusion Method Based on Double Federated UKF Algorithm[J].,2009,5:106.

点击复制

基于双联邦UKF算法的组合 导航数据融合方法(PDF)

《弹箭与制导学报》[ISSN:1673-9728/CN:61-1234/TJ] 期数: 2009年第5期 页码: 106 栏目: 导弹与制导技术 出版日期: 2009-10-25

Title: Integrated Navigation Data Fusion Method Based on Double Federated UKF Algorithm

作者: 吴志峰 1；吴 军 1；王 蕊 2

1 空军工程大学工程学院，西安 710038;2 东北大学材料与冶金学院，沈阳 110004

Author(s): WU Zhifeng 1 ; WU Jun 1 ; WANG Rui 2

1 The Engineering Institute, Air Force Engineering University, Xi’ a n 710038, China; 2 School of Materials & Metallurgy, Northeastern University, Shenyang 1 10004, China

关键词: GPS/INS/ DVS/JTIDS组合导航; 非线性滤波; 联邦滤波; UKF; 数据融合

Keywords: GPS/INS/ DVS / JTIDS integrated navigation; nonlinear filtering; federated filtering; UKF; data fusion

分类号: V241.62

DOI: -

文献标识码: A

摘要: 为了提高组合导航系统数据融合的精度和容错性，提出一种双联邦UKF组合导航数据融合方法。 采用双联邦UKF滤波器的算法将JTIDS相对导航技术与成熟的GPS/INS/DVS组合导航技术相结合组成 新的双联邦UKF组合导航数据融合算法。联邦UKF算法将UKF算法和分散式滤波技术相结合，精度高容 错性好，JTIDS相对导航技术精度高抗干扰能力强。主滤波器1对GPS/INS/DVS组合导航信息进行融合后 与JTIDS相对导航信息在主滤波器2中融合，提高了组合导航系统的可靠性

Abstract: In order to improve stability and fault tolerance of integ rated navigation data fusion, a new double federated UKF algorithm was designed. The new algorithm which used in the n ew integrated navigation data fusion method com ‐ bines the JTIDS relative navigation with GPS/INS/DVS integrated navi gation. The double federated UKF algorithm based on unscented Kalman filter algorithm and distributed informa tion fusion technology is featured with high stability and fault tolerance. JTIDS relative navigation has high accuracy a nd its anti ‐ jamming ability is strong. Master filter 1 was used to deal with the data of GPS/INS/DVS integrated navigati on; master filter 2 was used to deal with the result of master filter 1 and the JTIDS relative navigation data. The rel iability and the fault tolerance were improved by the double federated UKF filter. The simulation shows that this filter method has higher filter precision and better stability than the GPS/INS federated UKF; it is an ideal nonlinear filter m ethod of integrated

navigation.

参考文献/REFERENCES

［1］ 梅文华，蔡善法.JTIDS/Link16数据链 ［M ］.北京: 国防工业出版社，2007.

［2］ Julier S J，Uhlmann J K. A new extension of Kal ‐ man filter to nonlinear systems ［C ］//The Proceed ‐ ings of the American control conference. Seattle Washington， 1995: 1628-1632.

［3］ 韩崇昭，朱洪艳，段战胜.多源信息融合 ［M ］.北京: 清华大学出版社，2006.

［4］ 袁信，俞济祥，陈哲.导航系统 ［M ］.北京:航空工业 出版社，1993.

［5］ 王成刚，周新力，张铁英.基于INS/JITDS组合的 JTIDS相对导航 ［J ］.海军航空工程学院学报， 2004，19（2）:221-225.

［6］ 徐慧娟，吴美平，罗兵.EKF和UKF在INS/GPS 组合导航中的应用分析 ［J ］.航天控制，2006，24 （6）:7-10.

［7］ 杨常松，徐晓苏，汪丽云，等.信息融合技术在INS/ GPS/DVL组合导航中的应用研究 ［J ］. 中国惯性 技术学报，2006，14（5）: 39-43.

［8］ 袁冬莉，闫建国，王新民.无人机组合导航系统信息 融合方法研究 ［J ］.西北工业大学学报，2006，24 （5）:558-561.

备注/Memo: 收稿日期:2008-09-21作者简介:吴志峰（1980-），男，山东东营人，硕士，研究方向:智能信号处理。