



ISSN 1001-506X  
CN 11-2422/TN

# 系统工程与电子技术

Systems Engineering and Electronics

1

第35卷 第1期 2013年1月  
Vol.35 No.1 January 2013



ISSN 1001-506X



- 美国工程索引 (EI) 收录
- 英国科学文摘 (INSPEC) 收录
- 日本科学技术振兴机构数据库 (JST) 收录
- 中国核心期刊要目总览收录
- 中国核心期刊 (遴选) 数据库收录
- 中国科技论文统计源期刊
- 中国科学引文数据核心期刊

中国航天科工防御技术研究院 中国宇航学会 中国系统工程学会

系统工程电子技术

第 35 卷 第 1 期  
2013 年 1 月

目 次

· 电子技术 ·

|                                        |               |
|----------------------------------------|---------------|
| 集成多普勒观测的目标机动检测算法 .....                 |               |
| ..... 卢再奇, 樊建鹏, 刘 伟, 祝依龙, 范红旗          | 1             |
| 基于 VSMM 的 GMCPHD 滤波算法在多机动目标跟踪的应用 ..... |               |
| ..... 周卫东, 张鹤冰, 廖成毅                    | 9             |
| GPS 信号空时处理后码跟踪误差的补偿方法 .....            |               |
| ..... 相 飞, 廖桂生, 曾 操                    | 15            |
| 基于时差校正的长基线宽带测向算法 .....                 | 杨 健, 刘 渝, 狄 慧 |
| 20                                     |               |
| 基于方向性 S 变换的多分量 FM 信号瞬时频率估计 .....       |               |
| ..... 朱明哲, 姬红兵, 林 琳, 王 磊               | 29            |
| 全相位 FFT 相位差频谱校正法改进 .....               | 谭思炜, 任志良, 孙常存 |
| 34                                     |               |

· 传感器与信号处理 ·

|                                  |               |
|----------------------------------|---------------|
| 基于贝叶斯压缩感知的 SAR 目标识别 .....        | 张新征, 黄培康      |
| 40                               |               |
| 改进的联合子空间投影的 InSAR 干涉相位估计方法 ..... |               |
| ..... 李 海, 吴仁彪, 廖桂生              | 45            |
| 雷达高距离分辨率一维像目标识别 .....            | 郭尊华, 李 达, 张伯彦 |
| 53                               |               |
| 多径环境下的无源分布式孔径雷达成像方法 .....        |               |
| ..... 汪 玲, 卜晓楠, 庞 铄, 伍少华         | 61            |
| 距离-多普勒-时间三维雷达数据中的目标能量积累 .....    |               |
| ..... 吴兆平, 吴惠阳, 苏 涛              | 68            |
| 机载雷达射频隐身性能风险的计算模型 .....          |               |
| ..... 冯博宇, 王 璞, 安 航, 李 超         | 73            |

· 系统工程 ·

|                                   |    |
|-----------------------------------|----|
| 基于自适应伪谱法的 UCAV 低可探测攻击轨迹规划研究 ..... |    |
| ..... 刘鹤鸣, 丁达理, 黄长强, 黄汉桥, 王 铀     | 78 |
| 基于主客观综合赋权的 CGF 态势评估建模研究 .....     |    |
| ..... 张 媛, 刘文彪, 张立民               | 85 |
| 基于复杂网络理论的指挥控制系统自适应重构模型 .....      |    |
| ..... 田旭光, 朱元昌, 罗 坤, 张成名          | 91 |
| 基于 PSO 的方案阶段修理级别优化方法 .....        |    |
| ..... 郭霖瀚, 卞洁辉, 王乃超, 康 锐          | 97 |

|                         |                        |     |
|-------------------------|------------------------|-----|
| 退化系统状态维修决策与维修活动建模 ..... | 葛小凯, 胡剑波, 张博锋          | 102 |
| 维修器材联合订货的库存决策模型 .....   | 张建荣, 于永利, 张 柳, 聂成龙, 张伟 | 109 |
| 基于模糊聚类分析的证据组合 .....     | 王连锋, 宋建社, 朱 昱, 曹继平     | 113 |
| 考虑主体心理行为的双边匹配决策方法 ..... | 乐 琦                    | 120 |

#### • 制导、导航与控制 •

|                                   |                    |     |
|-----------------------------------|--------------------|-----|
| 卫星姿态系统的抗干扰完整性容错控制 .....           | 杨 婧, 史小平           | 126 |
| 基于磁强计/太阳敏感器的自主导航方法 .....          | 王 鹏, 张迎春           | 132 |
| 编队飞行最优相对轨迹生成与跟踪控制 .....           | 董晓光, 曹喜滨, 张锦绣, 施 梨 | 138 |
| 倾转旋翼飞行器无模型自适应姿态控制 .....           | 夏青元, 徐锦法, 张 梁      | 146 |
| ICDKF 在 SINS 大方位失准角初始对准中的应用 ..... | 郝燕玲, 牟宏伟, 贾鹤鸣      | 152 |
| 参数不确定性系统的鲁棒控制器数字化再设计研究 .....      | 徐 飞, 刘明雍, 李闻白, 雷小康 | 156 |
| 基于提升小波和递归增量聚类的实时故障诊断方法 .....      | 杨 青, 汤剑桥, 刘 畅, 刘 念 | 161 |

#### • 通信与网络 •

|                                     |                        |     |
|-------------------------------------|------------------------|-----|
| 基于随机型网络演算的 AFDX 端端时延分析方法 .....      | 伍志韬, 黄 宁, 王学望, 胡 宁     | 168 |
| 认知无线网络空闲频谱共享的竞争与合作定价 .....          | 汤海冰, 胡志刚               | 173 |
| 空间分集干扰对齐研究 .....                    | 王勤民, 张忠培, 刘 明, 结凤克     | 179 |
| 短波 IP 网络中速率自适应与 SR-ARQ 性能分析 .....   | 景 渊, 李栓红, 杨峰, 黄国策, 郭友波 | 184 |
| 基于改进 AMC 的 LTE MIMO 模式自适应切换算法 ..... | 付卫红, 张 飞, 刘乃安          | 191 |

#### • 软件、算法与仿真 •

|                              |                    |     |
|------------------------------|--------------------|-----|
| 非局部正则化的压缩感知图像重建算法 .....      | 李星秀, 韦志辉, 肖 亮, 费 选 | 196 |
| 基于阈值判断的区域指导插值算法 .....        | 赵旦峰, 王 博, 杨大伟      | 203 |
| 基于 KL 距离的交互式动态影响图近似算法 .....  | 田 乐, 罗 键, 曹浪财, 陈志平 | 207 |
| 核 Fisher 判别分析多参数自动优化算法 ..... | 常志朋, 程龙生           | 212 |
| 基于谐波自相关的基音检测 .....           | 王 杰, 耿丽红           | 218 |

#### • 可靠性 •

|                             |                    |     |
|-----------------------------|--------------------|-----|
| Bayes 序贯试验方法中风险的选择与计算 ..... | 刘 琦, 冯文哲, 王 因      | 223 |
| 基于 OBDD 的航空电子网络可靠性分析 .....  | 陈 瑶, 李 峭, 赵长啸, 熊 颖 | 230 |

# Systems Engineering and Electronics

Vol. 35 No. 1

January 2013

## CONTENTS

### Electronic Technology

- Target maneuver detection algorithm integrated with Doppler measurement ..... LU Zai-qi, FAN Jian-peng, LIU Wei, ZHU Yi-long, FAN Hong-qi 1
- Application of GMCPHD filter algorithm based on VSMM in multiple maneuvering targets tracking ..... ZHOU Wei-dong, ZHANG He-bing, LIAO Cheng-yi 9
- Compensation method for code tracking error of GPS induced by space-time adaptive processing ..... XIANG Fei, LIAO Gui-sheng, Zeng Cao 15
- Long baseline direction finding algorithm of wideband signal based on time-delay correction ..... YANG Jian, LIU Yu, DI Hui 20
- Instantaneous frequency estimation of multicomponent FM signals based on directional S transform ..... ZHU Ming-zhe, JI Hong-bing, LIN Lin, WANG Lei 29
- Improvement of phase difference correcting spectrum method based on all-phase FFT ..... TAN Si-wei, REN Zhi-liang, SUN Chang-cun 34

### Sensors and Signal Processing

- SAR ATR based on Bayesian compressive sensing ..... ZHANG Xin-zheng, HUANG Pei-kang 40
- Improved joint subspace projection method for InSAR interferometric phase estimation ..... LI Hai, WU Ren-biao, LIAO Gui-sheng 45
- Survey of radar target recognition using one-dimensional high range resolution profiles ..... GUO Zun-hua, LI Da, ZHANG Bo-yan 53
- Passive radar imaging using distributed apertures capable of operating in multipath environments ..... WANG Ling, BU Xiao-nan, PANG Shuo, WU Shao-hua 61
- Integration of target energy in 3-D radar data of range-Doppler-time ..... WU Zhao-ping, WU Hui-yang, SU Tao 68
- Computational model of radio frequency risk on stealth performance of airborne radar ..... FENG Bo-yu, WANG Ying, AN Hang, LI Chao 73

### Systems Engineering

- UCAV low observable attacking trajectory planning based on adaptive pseudospectral method ..... LIU He-ming, DING Da-li, HUANG Chang-qiang, HUANG Han-qiao, WANG You 78
- Situation assessment modeling for CGF based on the subjective and objective integrated weight ..... ZHANG Yuan, LIU Wen-biao, ZHANG Li-min 85
- Adaptive reconstruction model for command and control system under information age based on complex network theory ..... TIAN Xu-guang, ZHU Yuan-chang, LUO Kun, ZHANG Cheng-ming 91
- Optimal approach for level of repair analysis in concept phase based on PSO algorithm ..... GUO Lin-han, BIAN Jie-hui, WANG Nai-chao, KANG Rui 97
- Condition based maintenance decision of deteriorating systems and modeling of maintenance actions ..... GE Xiao-kai, HU Jian-bo, ZHANG Bo-feng 102
- Inventory decision model of joint ordering policy with maintenance materials ..... ZHANG Jian-rong, YU Yong-li, ZHANG Liu, NIE Cheng-long, ZHANG Wei 109

|                                                                                                        |                            |
|--------------------------------------------------------------------------------------------------------|----------------------------|
| Evidence combination based on fuzzy clustering analysis .....                                          |                            |
| ..... WANG Lian-feng, SONG Jian-she, ZHU Yu, CAO Ji-ping                                               | 113                        |
| Decision method for two-sided matching considering agents' psychological behavior .....                | YUE Qi 120                 |
| <b>Guidance, Navigation and Control</b>                                                                |                            |
| Integrity fault tolerant attitude controller of satellite with disturbance attenuation .....           |                            |
| ..... YANG Jing, SHI Xiao-ping                                                                         | 126                        |
| Research on autonomous navigation method based on magnetometer and sun sensor .....                    |                            |
| ..... WANG Peng, ZHANG Ying-chun                                                                       | 132                        |
| Optimal relative trajectory generation and tracking control of formation flying .....                  |                            |
| ..... DONG Xiao-guang, CAO Xi-bin, ZHANG Jin-xiu, SHI Li                                               | 138                        |
| Model-free adaptive attitude controller for a tilt-rotor aircraft .....                                |                            |
| ..... XIA Qing-yuan, XU Jin-fa, ZHANG Liang                                                            | 146                        |
| Application of ICDKF in initial alignment of large azimuth misalignment in SINS .....                  |                            |
| ..... HAO Yan-ling, MU Hong-wei, JIA He-ming                                                           | 152                        |
| Research on digitized redesign of the robust controller for parameter uncertain systems .....          |                            |
| ..... XU Fei, LIU Ming-yong, LI Wen-bai, LEI Xiao-kang                                                 | 156                        |
| Real-time fault diagnosis approach based on lifting wavelet and recursive incremental clustering ..... |                            |
| ..... YANG Qing, TANG Jian-qiao, LIU Chang, LIU Nian                                                   | 161                        |
| <b>Communications and Networks</b>                                                                     |                            |
| Analysis of end-to-end delay on AFDX based on stochastic network calculus .....                        |                            |
| ..... WU Zhi-tao, HUANG Ning, WANG Xue-wang, HU Ning                                                   | 168                        |
| Competitive and cooperative pricing for idle spectrum sharing in cognitive radio networks .....        |                            |
| ..... TANG Hai-bing, HU Zhi-gang                                                                       | 173                        |
| Research on spatial diversity interference alignment .....                                             |                            |
| ..... WANG Qin-min, ZHANG Zhong-pei, LIU Ming, JIE Feng-ke                                             | 179                        |
| Performance analysis of rate adaptation and SR-ARQ in high frequency IP network .....                  |                            |
| ..... JING Yuan, LI Shuan-hong, YANG Feng, HUANG Guo-ce, GUO You-bo                                    | 184                        |
| An adaptive MIMO mode switching algorithm based on improved AMC in LTE system .....                    |                            |
| ..... FU Wei-hong, ZHANG Fei, LIU Nai-an                                                               | 191                        |
| <b>Software, Algorithm and Simulation</b>                                                              |                            |
| Compressed sensing image reconstruction algorithm based on non-local regularization .....              |                            |
| ..... LI Xing-xiu, WEI Zhi-hui, XIAO Liang, FEI Xuan                                                   | 196                        |
| Area-directed image interpolation algorithm based on threshold .....                                   |                            |
| ..... ZHAO Dan-feng, WANG Bo, YANG Da-wei                                                              | 203                        |
| Approximate algorithm of interactive dynamic influence diagrams based on KL distance .....             |                            |
| ..... TIAN Le, LUO Jian, CAO Lang-cai, CHEN Zhi-ping                                                   | 207                        |
| Automatic optimization algorithm of multiple parameters for kernel fisher discriminant analysis .....  |                            |
| ..... CHANG Zhi-peng, CHENG Long-sheng                                                                 | 212                        |
| Pitch detection based on a harmonic autocorrelation method .....                                       | WANG Jie, GENG Li-hong 218 |
| <b>Reliability</b>                                                                                     |                            |
| Selection and calculation of risks in Bayes sequential test method .....                               |                            |
| ..... LIU Qi, FENG Wen-zhe, WANG Nan                                                                   | 223                        |
| OBDD-based reliability analysis for avionics networks .....                                            |                            |
| ..... CHEN Yao, LI Qiao, ZHAO Chang-xiao, XIONG Ying                                                   | 230                        |