



ESCI, EI 等数据库收录期刊

ISSN 1009-5896
CODEN DKXUEC
CN 11-4494/TN

电子与信息学报

JOURNAL OF ELECTRONICS & INFORMATION TECHNOLOGY

1

2023. Vol.45



本期专题/Topic

后摩尔时代集成电路颠覆性技术

Disruptive Technologies for Integrated Circuits in the Post-Moore Era



电子与信息学报

DIANZI YU XINXI XUEBAO

第45卷第1期

2023年1月

目次

“后摩尔时代集成电路颠覆性技术”专题

基于机器学习的FPGA电子设计自动化技术研究综述	(1)
..... 田春生, 陈雷, 王源, 王硕, 周婧, 庞永江, 杜忠	
基于布尔可满足性的精确逻辑综合综述	(14)
..... 储著飞, 潘鸿洋	
基于强化学习的多核芯片动态功耗管理框架	(24)
..... 卓成, 曾旭东, 陈宇飞, 孙淞昱, 罗国杰, 贺青, 尹勋钊	
面向心电检测的混合多模卷积神经网络加速器设计	(33)
..... 刘冬生, 魏来, 邹雪城, 陆家昊, 成轩, 胡昂, 李德建, 赵旭, 蒋曲明	
基于亚阈值电流阵列的低成本物理不可克隆电路设计	(42)
..... 崔益军, 张虎, 闫成刚, 王成华, 刘伟强	
基于数据预处理的侧信道分析优化方法	(49)
..... 赵毅强, 王庆雅, 马浩诚, 张启智, 叶茂, 王汉宁, 何家骥	
用于检测硬件木马延时的线性判别分析算法	(59)
..... 宋钛, 黄正峰, 徐辉	
利用多路选择器熵源的高移植性轻量级物理不可克隆函数研究	(68)
..... 姚亮, 梁华国, 杨世豪, 章宏, 鲁迎春	
一种面向序列密码的混合粒度并行运算单元	(78)
..... 曲彤洲, 戴紫彬, 陈琳, 刘燕江	
基于部分积概率分析的高精度低功耗近似浮点乘法器设计	(87)
..... 闫成刚, 赵轩, 徐宸宇, 陈珂, 葛际鹏, 王成华, 刘伟强	
基于遗传算法的抗网表逆向攻击逻辑混淆方法	(96)
..... 赵毅强, 蒯钧, 马浩诚, 张启智, 高雅, 叶茂, 何家骥	
基于忆阻器的图卷积神经网络加速器设计	(106)
..... 李冰, 午康俊, 王晶, 李森, 高岚, 张伟功, 倪天明	
一种面向基于闪存的脉冲卷积神经网络的模拟神经元电路	(116)
..... 顾晓峰, 刘彦航, 虞致国, 钟啸宇, 陈轩, 孙一, 潘红兵	
电路与传感器设计	
一种使用改进预测成本矩阵任务优先排序的异构计算系统列表调度算法	(125)
..... 姚宇, 宋宇鲲, 杨国伟, 黄英, 张多利	
射频低噪声放大器提高三阶交截点方法探讨	(134)
..... 赵巾翔, 汪峰, 于汉超, 王魁松, 张胜利, 梁晓新, 阎跃鹏	
基于锆钛酸铅的低电压驱动MEMS电场传感器研究	(150)
..... 雷虎成, 夏善红, 彭春荣, 毋正伟, 张洲威, 刘俊, 彭思敏, 刘向明, 高雅浩	
天线与阵列信号处理	
标签分布疏密状态变化情形下超高频天线设计方法研究	(158)
..... 佐磊, 曹雪兵, 朱良帅, 丁雨晴, 孙梦婷	
间隙波导技术及其空间应用	(168)
..... 陈翔, 孙冬全, 崔万照	
基于无人机集群的近场线性稀疏阵列波束形成研究	(181)
..... 张逸楠, 王广学, 彭世蕤, 冷毅	

多扩展目标跟踪中基于多特征优化的传感器控制方法	陈 辉, 魏凤旗, 韩崇昭	(191)
超宽带太赫兹通信中天线结构设计及其波束色散影响分析	郝万明, 尤晓蓓, 孙钢灿, 朱政宇	(200)
无线通信与物联网		
基于干扰消除辅助稀疏连接神经网络的大规模MIMO信号检测	申 滨, 阳 建, 曾相誌, 崔太平	(208)
移动边缘计算中基于联邦学习的视频请求预测和协作缓存策略	李光辉, 李宜璟, 胡世红	(218)
基于自适应梯度压缩的高效联邦学习通信机制研究	唐 伦, 汪智平, 蒲 昊, 吴 壮, 陈前斌	(227)
蜂窝车联网中基于服务异构性的V2V通信资源分配算法研究	李一兵, 王宁馨, 吕 威	(235)
基于硬件损伤的异构网络鲁棒安全资源分配算法	徐勇军, 曹 奇, 万杨亮, 周继华, 赵 涛, 陈前斌	(243)
移动Ad Hoc云中基于能量收集的分布式卸载方案研究	鲜永菊, 郭陈榕, 夏士超, 李 云	(254)
网络切片场景下基于分布式生成对抗网络的服务功能链异常检测	唐 伦, 王 恺, 张 月, 周鑫隆, 陈前斌	(262)
基于动态异构冗余架构的车载网络内生安全机制	王 鹏, 翟淳琨, 李玉峰, 郑秋生	(272)
图像与智能信息处理		
基于多尺度双邻域显著性的高分四号遥感图像运动船舶检测方法	余 伟, 尤红建, 胡玉新, 刘 瑞	(282)
基于深度引导与自学习的高动态成像算法	张俊超, 杨飞帆, 时 伟, 陈溅来, 赵党军, 杨德贵	(291)
基于局部亮度直方图的自适应视频帧类型决策算法	刘鹏宇, 张 悦, 贾克斌, 段 堃, 刘 畅, 孙 莹, 崔腾鹤	(300)
基于持续学习和联合特征提取的特定辐射源识别	张立民, 谭凯文, 闫文君, 张婷婷, 汤 森	(308)
基于跨视角相似度顺序保持的基因特征提取方法	苏树智, 张开宇, 王子莹, 张茂岩	(317)
融合子空间共享特征的多尺度跨模态行人重识别方法	王凤随, 闫 涛, 刘芙蓉, 钱亚萍, 许 月	(325)
基于双层解耦策略和注意力机制的遮挡目标分割	吕 岳, 周浙泉, 吕淑静	(335)
密码学与信息安全		
对TwAES的相关调柄多重不可能差分攻击	蒋梓龙, 金晨辉	(344)
一种三元线性补对偶码的构造方法	黄 山, 朱士信, 李 锦	(353)
综述评论		
基于压缩感知的贪婪类重构算法原子识别策略综述	刘素娟, 崔程凯, 郑丽丽, 江书阳	(361)
云应用程序编程接口安全研究综述: 威胁与防护	陈 真, 乞文超, 贺鹏飞, 刘林林, 申利民	(371)

JOURNAL OF ELECTRONICS & INFORMATION TECHNOLOGY

Vol.45 No.1 January 2023

CONTENTS

Special Topic on Disruptive IC Technology in the Post Moore Era

- A Survey on FPGA Electronic Design Automation Technology Based on Machine Learning
..... *TIAN Chunsheng, CHEN Lei, WANG Yuan, WANG Shuo, ZHOU Jing, PANG Yongjian, DU Zhong* (1)
- Survey on Exact Logic Synthesis Based on Boolean SATisfiability *CHU Zhufei, PAN Hongyang* (14)
- Multi-core Chip Dynamic Power Management Framework Based on Reinforcement Learning
..... *ZHUO Cheng, ZENG Xudong, CHEN Yufei, SUN Songyu, LUO Guojie, HE Qing, YIN Xunzhao* (24)
- Design of Hybrid Multimode Convolutional Neural Network Accelerator for Electrocardiogram Detection
..... *LIU Dongsheng, WEI Lai, ZOU Xuecheng, LU Jiahao, CHENG Xuan, HU Ang, LI Dejian, ZHAO Xu,*
JIANG Quming (33)
- Low-cost PUF Circuit Based on Sub-threshold Current Array
..... *CUI Yijun, ZHANG Hu, YAN Chenggang, WANG Chenghua, LIU Weiqiang* (42)
- Side Channel Analysis Optimization Method Based on Data Preprocessing
..... *ZHAO Yiqiang, WANG Qingya, MA Haocheng, ZHANG Qizhi, YE Mao, WANG Hanning, HE Jiaji* (49)
- Linear Discriminant Analysis Algorithm for Detecting Hardware Trojans Delay
..... *SONG Tai, HUANG Zhengfeng, XU Hui* (59)
- Research on Highly Portable Lightweight Physical Unclonable Functions Using Multiplexer Entropy Sources
..... *YAO Liang, LIANG Huaguo, YANG Shihao, ZHANG Hong, LU Yingchun* (68)
- A Hybrid Granularity Parallel Arithmetical Unit for Stream Cipher
..... *QU Tongzhou, DAI Zibin, CHEN Lin, LIU Yanjiang* (78)
- Design of High Precision Low Power Approximate Floating-point Multiplier Based on Partial Product Probability
Analysis
..... *YAN Chenggang, ZHAO Xuan, XU Chenyu, CHEN Ke, GE Jipeng, WANG Chenghua, LIU Weiqiang* (87)
- A Novel Logic-obfuscation Method to Resist Netlist-reverse Attack Based on Genetic Algorithm
..... *ZHAO Yiqiang, KUAI Jun, MA Haocheng, ZHANG Qizhi, GAO Ya, YE Mao, HE Jiaji* (96)
- Design of Graph Convolutional Network Accelerator Based on Resistive Random Access Memory
..... *LI Bing, WU Kangjun, WANG Jing, LI Sen, GAO Lan, ZHANG Weigong, NI Tianming* (106)
- An Analog Neuron Circuit for Spiking Convolutional Neural Networks Based on Flash Array
..... *GU Xiaofeng, LIU Yanhang, YU Zhiguo, ZHONG Xiaoyu, CHEN Xuan, SUN Yi, PAN Hongbing* (116)
- ### Circuit and Sensor Design
- A List Scheduling Algorithm for Heterogeneous Computing Systems Using Improved Predict Cost Matrix for Task
Prioritizing *YAO Yu, SONG Yukun, YANG Guowei, HUANG Ying, ZHANG Duoli* (125)
- Discussion on Improving the Third Order Intersection Point of Radio Frequency Low Noise Amplifier
ZHAO Jinxiang, WANG Feng, YU Hanchao, WANG Kuisong, ZHANG Shengli, LIANG Xiaoxin, YAN Yuepeng (134)
- Research on MEMS Electric Field Sensor with Low Driving Voltage Based on Lead Zirconate Titanate
..... *LEI Hucheng, XIA Shanhong, PENG Chunrong, WU Zhengwei, ZHANG Zhouwei, LIU Jun,*
PENG Simin, LIU Xiangming, GAO Yahao (150)
- ### Antenna and Array Signal Processing
- Research on the Design Method of UHF Antenna under the Condition of Changing Tag Distribution Density
..... *ZUO Lei, CAO Xuebing, ZHU Liangshuai, DING Yuqing, SUN Mengting* (158)
- Gap Waveguide Technology and its Space Applications *CHEN Xiang, SUN Dongquan, CUI Wanzhao* (168)

(To be continued on inside back cover)

(Continued)

Beamforming Research for Near-field Linear Sparse Array Based on Unmanned Aerial Vehicle Swarm	(181)
..... ZHANG Yinan, WANG Guangxue, PENG Shirui, LENG Yi	
Sensor Control Based on Multiple Feature Optimization in Multiple Extended Targets Tracking	(191)
..... CHEN Hui, WEI Fengqi, HAN Chongzhao	
Design of Antenna Structure and Analysis of Beam Split Effect in Ultra-Bandwidth Terahertz Communications	(200)
..... HAO Wanming, YOU Xiaobei, SUN Gangcan, ZHU Zhengyu	

Wireless Communication and Internet of Things

Massive MIMO Signal Detection Based on Interference Cancellation Assisted Sparsely Connected Neural Network	(208)
..... SHEN Bin, YANG Jian, ZENG Xiangzhi, CUI Taiping	
Video Request Prediction and Cooperative Caching Strategy Based on Federated Learning in Mobile Edge Computing	(218)
..... LI Guanghui, LI Yijing, HU Shihong	
Research on Efficient Federated Learning Communication Mechanism Based on Adaptive Gradient Compression	(227)
..... TANG Lun, WANG Zhiping, PU Hao, WU Zhuang, CHEN Qianbin	
Research on Resource Allocation Algorithm Based on Service Heterogeneity in V2V Communication in C-V2X	(235)
..... LI Yibing, WANG Ningxin, LÜ Wei	
Robust Secure Resource Allocation Algorithm for Heterogeneous Networks with Hardware Impairments	(243)
..... XU Yongjun, CAO Qi, WAN Yangliang, ZHOU Jihua, ZHAO Tao, CHEN Qianbin	
Research on Distributed Offloading Scheme Based on Energy Harvesting in Mobile Ad Hoc Cloud	(254)
..... XIAN Yongju, GUO Chenrong, XIA Shichao, LI Yun	
Service Function Chain Anomaly Detection Based on Distributed Generative Adversarial Network in Network Slicing Scenario	(262)
..... TANG Lun, WANG Kai, ZHANG Yue, ZHOU Xinlong, CHEN Qianbin	
Endogenous Security Mechanism of Vehicle Network Based on Dynamic Heterogeneous Redundancy	(272)
..... WANG Peng, ZHAI Bokun, LI Yufeng, ZHENG Qiusheng	

Image and Intelligent Information Processing

Moving Ship Detection Method Based on Multi-scale Dual-neighborhood Saliency for GF-4 Satellite Remote Sensing Images	(282)
..... YU Wei, YOU Hongjian, HU Yuxin, LIU Rui	
Method for High Dynamic Range Imaging Based on Deep Guided and Self-learning	(291)
..... ZHANG Junchao, YANG Feifan, SHI Wei, CHEN Jianlai, ZHAO Dangjun, YANG Degui	
Adaptive Video Frame Type Decision Algorithm Based on Local Luminance Histogram	(300)
..... LIU Pengyu, ZHANG Yue, JIA Kebin, DUAN Kun, LIU Chang, SUN Xuan, CUI Tenghe	
Specific Emitter Identification Based on Continuous Learning and Joint Feature Extraction	(308)
..... ZHANG Limin, TAN Kaiwen, YAN Wenjun, ZHANG Tingting, TANG Miao	
A Gene Feature Extraction Method Based on Across-view Similarity Order Preserving	(317)
..... SU Shuzhi, ZHANG Kaiyu, WANG Ziyi, ZHANG Maoyan	
Multi-scale Cross-Modality Person Re-identification Method Based on Shared Subspace Features	(325)
..... WANG Fengsui, YAN Tao, LIU Furong, QIAN Yaping, XU Yue	
Occluded Object Segmentation Based on Bilayer Decoupling Strategy and Attention Mechanism	(335)
..... LÜ Yue, ZHOU Zhequan, LÜ Shujing	

Cryption and Information Security

Related-Tweak Multiple Impossible Differential Attack for Tweakable AES	(344)
..... JIANG Zilong, JIN Chenhui	
A Method for Constructing Ternary Linear Complementary Dual Codes	(353)
..... HUANG Shan, ZHU Shixin, LI Jin	

Overviews

A Review of Atom Recognition Strategies for Greedy Class Reconstruction Algorithms Based on Compressed Sensing	(361)
..... LIU Sujuan, CUI Chengkai, ZHENG Lili, JIANG Shuyang	
A Survey for Cloud Application Programming Interface Security: Threats and Protection	(371)
..... CHEN Zhen, QI Wenchao, HE Pengfei, LIU Linlin, SHEN Limin	