

2021 5th International Conference on Communication and Information Systems (ICCIS 2021)

**Chongqing, China
15 – 17 October 2021**



**IEEE Catalog Number: CFP21OAA-POD
ISBN: 978-1-6654-2217-8**

**Copyright © 2021 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP21OAA-POD
ISBN (Print-On-Demand):	978-1-6654-2217-8
ISBN (Online):	978-1-6654-2216-1

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

2021 5th International Conference on Communication and Information Systems (ICCIS 2021)

Table of Contents

Preface	vii
Committee	viii

❖ **Communication Theory and Technology**

Simplified Expression for Ziv-CZakai Bound in MIMO Radar Systems	1
<i>Zhiyuan Zhai, Qiling Xu, Liming Wang, Xuejing Zhang</i>	
A 12.5Gbps Novel SerDes Transmitter for JESD204B Physical Layer	6
<i>Bo Liu, Zongmin Wang, Tieliang Zhang, Lei Zhang</i>	
Meter Reading System Based on NB-IoT.....	13
<i>Hongyu Sun, Song Wang, Dong Han, Die Zhang</i>	
On the Optimization of Flow Tables of SDN-enabled Switches	18
<i>Lishui Chen, Yongqi Zhang, Yazhe Tang</i>	
A 2.47-10V Curvature-corrected Bandgap Reference for LDO.....	23
<i>Yidong Cao, Zhiping Wen</i>	
STFDs and FBSS Techniques for Direction of Arrival Estimation of Coherent LFM Sources	29
<i>Li Dengxin, Cui Kaibo, Jia Hongyang, Yuan Naichang</i>	
LSTCN: An Attention-based Deep Neural Network Model Combining LSTM and TCN for Cellular Network Traffic Prediction.....	34
<i>Xiaoyang Xu, Suixiang Gao, Zhipeng Jiang</i>	
DPTCN-ATPP: Multi-scale End-to-end Modeling for Single-channel Speech Separation	39
<i>Yanmin Zhu, Xiang Zheng, Xinrong Wu, Wanning Liu, Lei Pi, Meiju Chen</i>	
❖ Digital Communication and Wireless Technology	
Power Allocation of Energy Harvesting Cognitive Radio Based on Deep Reinforcement Learning.....	45
<i>Huan Xie, Ruiquan Lin, Jun Wang, Min Zhang, Changchun Cheng</i>	

Spectrum Handoff Using Game Theory with Hypergraph Scheme in Distributed Cognitive Radio Networks	50
<i>Yunfei Peng, Wei Shao, Chunlan Lu, Shufeng Li, Chuang Wang, Wenyu Ma</i>	
Density Wireless Network Stochastic Geometry Modeling and Queuing Analysis	60
<i>Shuguang Fang</i>	
Optimal Directional Charging Angle in Wireless Rechargeable Sensor Network.....	65
<i>Zihao Tan, Dalin Cao, Shuangjuan Li, Qiong Huang</i>	
Optimal Relay Selection for Cache-aided Full-duplex SWIPT Systems with Maximal Throughput.....	71
<i>Taoshen Li, Anni Shi, Jichang Chen</i>	
Multi-node Online Charging Scheduling in Wireless Rechargeable Sensor Networks	78
<i>Yanfeng Li, Shuangjuan Li, Qiong Huang</i>	
❖ Advanced Electronics and Information Technology	
Design and Development of a Chip Thermal Characterization and Operating Junction Temperature Measurement System for ADN8834 TEC Controller Using ESD Protection Diode Voltage Method.....	86
<i>Noel C. Tenorio</i>	
Optimization Scheme and Design of Servo Power Supply for Aerospace Vehicle	98
<i>Zhang Yi Qi, Li Yan, Zhao Xiao Rui, Yan Shuang, Xu Xiu Hua</i>	
LOMI: Logic Gate Multiplexer Integrated Circuit using Verilog HDL	103
<i>Rosemarie V. Pellegrino, Jocelyn F. Villaverde, Mark Mackoy M. Dela Peña, Liam Christopher L. Domingo</i>	
Research and Application of Semantic Point Cloud on Indoor Robots	108
<i>Chen Fei Ling, Shu Wen Dang, Cheng Yi Zhang, Yong Chen</i>	
Study on Poincare Plot Characteristics of Dynamic Pressure at Outlet of Centrifugal Compressor Based on Edge Crawling Algorithm	114
<i>Yan Liu, Yan Huang, Jun Xiao</i>	
Design of Intelligent Well Cover Monitoring System Based on Lora.....	119
<i>Yaqi Guan, Qun Hou</i>	
The Study of LSPR Biosensor Data Processing Based on Deep Learning	124
<i>Jingwen Wang, Peng Ran, Yuhan Luo, Peihan Tian, Yalan Mao</i>	
Intent Matching based Customer Services Chatbot with Natural Language Understanding	129
<i>Alvin Chaidrata, Mariyam Imtha Shafeeu, Sze Ker Chew, Zhiyuan Chen, Jin Sheng Cham, Zi Li Yong, Uen Hsieh Yap, Dania Imanina Binti Kamarul Bahrin</i>	

❖ **Intelligent Recognition Technology and Image Processing**

Multi-focus Red and White Blood Cell Image Fusion Based on Content Adaptive Blur	134
<i>Xiaoming Jiang, Siwan Shen, Junyuan Liu</i>	
Robust Image Segmentation for Crops based on the Combination of Multiple Color Index Transformation and Fuzzy Clustering.....	139
<i>Qiaowen Huang</i>	
Nonlocal Regularized CNN for Inpainting Using Edge Prior	144
<i>Chen Luo, Yubo You, Qiyu Jin</i>	
Fast Center Location Method of Edge Detection Based on Canny Operator	149
<i>Wenhua Qiu, Liang Wang, Zhenzhen Qiu</i>	
Demixing and Topology Identification for Mixed Graph Signals	154
<i>Jian Hong, Xuchu Dai</i>	
Driver Distraction Recognition Based on Transfer Learning and Feature Fusion	160
<i>Manzhi Chen, Yingcheng Lin, Zhiyong Huang, Xiaoping Zeng</i>	
Raspberry PI based Food Recognition for Visually Impaired using YOLO Algorithm	165
<i>Analyn N. Yumang, Dave Emilson S. Banguilan, Clark Kent S. Veneracion</i>	
Person Re-identification Based on Improved Residual Neural Networks	170
<i>Xiaoyu Shi</i>	
Non-destructive Image Processing Analysis for Defect Identification and Maturity Detection on Avocado Fruit	175
<i>Leonardo D. Valiente Jr., Kristine Mhae R. Parco, Gabriel Carlo P. Sangalang</i>	

❖ **Computer and Information Engineering**

Dynamic IMU Calibration in IMU-MoCap on Lower Limbs Based on Joint Constraints.....	180
<i>Lingfeng Liu, Qian Hu, Feng Mei</i>	
A Novel Virus Propagation Mathematical Model for Infectious Diseases.....	185
<i>Wenjing Wu, Yongqiang Yu, Ruochen Li, Yehua Tang</i>	
Derivation and Formal Proof of Binary Tree Depth Non-Recursive Algorithm	191
<i>Zhengkang Zuo, Yue Fang, Qing Huang, Yunyan Liao, Yuan Wang, Changjing Wang</i>	
An Improved U-Net for Nuclei Semantic Segmentation.....	197
<i>Yubo You, Chen Luo, Qiyu Jin</i>	

Derivation and Formal Proof of Floyd-Warshall Algorithm	202
<i>Zhengkang Zuo, Xiaodan Liu, Qing Huang, Yunyan Liao, Yuan Wang, Changjing Wang</i>	
Chinese-oriented Russian Language Online Classes: What We Learned from the Pandemic.....	208
<i>Antonio Carluccio, Inna Rubakova</i>	
Improving Information Security in Smart City	215
<i>Wei Zhang, Thelma Palaoag</i>	
Classification of AUD Inpatients Based on Brain Activity fMRI Data Clustering.....	222
<i>Abdulqawi Alarefi, Xunshi Wang, Rui Tao, Qinqin Rui, Guoqing Gao, Liangjun Pang, Bensheng Qiu, Xiaochu Zhang</i>	

Author Index