

# **2020 IEEE 3rd International Conference on Information Communication and Signal Processing (ICICSP 2020)**

**Shanghai, China  
12-15 September 2020**



**IEEE Catalog Number: CFP20NYU-POD  
ISBN: 978-1-7281-8824-9**

**Copyright © 2020 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:	CFP20NYU-POD
ISBN (Print-On-Demand):	978-1-7281-8824-9
ISBN (Online):	978-1-7281-8823-2

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# Table of Contents

## 2020 3rd IEEE International Conference on Information Communication and Signal Processing-(ICICSP 2020)

Preface.....	xi
Committees.....	xii

---

### Session 1—Signal Acquisition and Processing

Demystifying the Rumbling Noise Generated from the Elevator Machine Room .....	1
<i>Alex Shi</i>	
A Robust Residual Echo Suppression Algorithm Even During Double Talk.....	6
<i>Bingxiao Fang</i>	
A Digital Modulation Recognition Method Based on Uniform Linear Array .....	10
<i>Yang Yangqiang, Wu Dong, Yang Lifan</i>	
Analysis of Crosstalk and Noise Limitation in a WDM Network with MWSF Based Limited Wavelength Interchange Optical Cross Connect.....	15
<i>Munira Haque, S. P. Majumder</i>	
An Improved Complex-valued FastICA Algorithm for Jamming Signals Sorting in Beidou Navigation Satellite System .....	20
<i>Guangshun Xie, Huaiyu Tang, Rui Xue</i>	
A Time-domain Unsupervised Learning Based Sound Source Localization Method.....	26
<i>Yankun Huang, Xihong Wu, Tianshu Qu</i>	
A Novel Demodulation Network for Binary Partial Response CPM Signals.....	33
<i>Haowei Wu, Qihao Peng, Jiaying Wang, Rui Ma, Jinglan Ou</i>	
A Novel Parameter Estimation Scheme for Noncooperative Binary Offset Carrier Modulated Signals .....	38
<i>Yongfeng Wu, Huaiyu Tang, Rui Xue</i>	

### Session 2— Signal Detection and Filtering Technology

Target Tracking of Radar Seeker Based on Converted Measurement Kalman Filter .....	43
<i>Shi Wen, Wang Zhengyang, Zhou Shiping, Li Yunji, Hu Zhe</i>	
Analysis of Class E Power Amplifier with Shunt Filter under Different Duty Cycles .....	47
<i>Hua Zaijun, Huang Fengchen, Li Jianni and Chen Zhao</i>	
A Novel Clutter Covariance Matrix Reconstruction Method for Airborne STAP .....	52
<i>Mingxin Liu, Lin Zou, Xuegang Wang</i>	
Correlation Filter-based Object Tracking Algorithms .....	57
<i>Songke Zhao, Kewei Sun, Yuanfa Ji, Ning Guo, Xizi Jia</i>	
Analysis of the Boundary Effect on Signal Detection in Unwrapped Phase Noise .....	63
<i>Zhongtao Luo and Yanmei Zhan, Yangyong Zhang</i>	
Learning-Based Signal Detection for OFDM Systems with I/Q Imbalance .....	69
<i>Jinglan Ou, Jiaying Wang, Qihao Peng, Xingxin Zhu, Haowei Wu</i>	
M-Estimation-Based Robust Kalman Filter Algorithm for Three-Dimensional AoA Target Tracking .....	74
<i>Yuexin Zhao, Wangdong Qi, Peng Liu, Jie Lin</i>	
An Improved Particle Filter Based on UKF and Weight Optimization .....	80
<i>Zhao Hui, Wang Lifen, Ren Yuan, Geng Mengmeng</i>	

### **Session 3— Underwater Acoustics and Underwater Signal Processing**

Frequency-Difference Matched Field Processing for Broadband Source Localization with One Hydrophone in Shallow Ocean Environment.....	84
<i>Yonggang Lin, Min Zhu, Yanqun Wu, Wen Zhang</i>	
Signal Design and Processing for Underwater Acoustic Positioning and Communication Integrated System .....	89
<i>Chengcai Lv, Binjian Shen, Chuan Tian, Shengzong Zhang, Liang Yu, Dazhen Xu</i>	
Real-time Signal Acquisition Algorithm and Optimization for DSSS Broadband Underwater Acoustic Positioning.....	94
<i>Fan Shang, Wen Zhang, Xiangguo Chen, Yu Zhang</i>	
Vector sound field calculation for range-dependent ocean environments .....	99
<i>Mei Sun, Yubo Qi, Shuyuan Du and Shihong Zhou</i>	
An Optimization Method for Sound Speed Profile Inversion Using Empirical Orthogonal Function Analysis .....	104
<i>Chen Liu, Kaifeng Han, Wen Zhang and Wen Chen</i>	
A DOA Estimation algorithm for the vertical line array of vector hydrophone based on data fusion method .....	108
<i>Yan Liang, Zhou Meng, Yu Chen, Jianfei Wang, Xin Zhou, Mingyang Wang</i>	

Geoacoustic inversion based on matched impulse response processing for moving source .....	113
<i>Yanqun Wu, Wen Zhang, Yonggang Lin, Guojun Xu, and Bingbing Zhang</i>	
Application of the Sparse Low-rank Model in Denoising of Underwater Acoustic Signal .....	117
<i>YaoWen Wu, ChuanXi Xing, YiFan Zhao</i>	
Passive Source Ranging Using Residual Neural Network with One Hydrophone in Shallow Water .....	122
<i>Yonggang Lin, Min Zhu, Yanqun Wu, Wen Zhang</i>	
Sound speed profile and geoacoustic parameters estimation .....	126
<i>Xiaofeng Zhao, Jiaqi Ding, YongChui Zhang, Pinglv Yang, Chenjing Tian, ZeMing Zhou, Chongwei Zheng</i>	
Sonar echo signal processing based on Convolution Blind source separation .....	130
<i>Zhang Yan, Sun Sheng-kai, Liu Yue and Wang Jia-qi</i>	
Numerical Study of Acoustic Propagation Characteristics in the Multi-scale Seafloor Random Media.....	135
<i>Kaifeng Han, Chen Liu, Wen Zhang</i>	

## **Session 4— Modern Speech Analysis and Processing Technology**

Mandarin Singing Synthesis Based on Generative Adversarial Network.....	139
<i>Yun Zhou, Hongwu Yang, Ziyang Chen, Yajing Yan</i>	
Optimal vowels measurements for Obstructive Sleep Apnea Detection Using Speech Signals .....	143
<i>Kang-Gao Pang, Tai-Chiu Hsung, Alex Ka-Wing Law and Winnie W.S. Choi</i>	
Simple Data Augmented Transformer End-To-End Tibetan Speech Recognition.....	148
<i>Xiaodong Yang, Weizhe Wang, Hongwu Yang, Jiaolong Jiang</i>	
Spoken Language Identification with Deep Temporal Neural Network and Multilevels Discriminative Cues .....	153
<i>Linjia Sun</i>	
End-to-End Low-Resource Speech Recognition with a Deep CNN-LSTM Encoder .....	158
<i>Weizhe Wang, Xiaodong Yang, Hongwu Yang</i>	
Speech Emotion Recognition based on Interactive Convolutional Neural Network .....	163
<i>Huihui Cheng, Xiaoyu Tang</i>	
Bone-Conducted Speech to Air-Conducted Speech Conversion Based on Cycle-Consistent Adversarial Networks .....	168
<i>Qing Pan, Jian Zhou, Teng Gao, Liang Tao</i>	

## **Session 5— Target Detection and Algorithm**

Metro Pedestrian Detection Based on Mask R-CNN and Spatial-temporal Feature .....	173
<i>Guochen Shen, Faezeh Jamshidi, Decun Dong, Rei ZhG</i>	
Experimental Results of Maritime Target Detection Based on SVM Classifier .....	179
<i>Song jie, Hu Wankun</i>	
Fast TLAM: High-precision Fine Grain Smoking Behavior Detection Network .....	183
<i>Zhang Yang, Dengfeng Yao</i>	
The Night Flame Detection Algorithm Based on Sequential Frame Difference .....	189
<i>Le Ma, Feng Yu, Changlong Zhou, Minghua Jiang, Xiong Wei</i>	
A Low-complexity Steered Minimum Variance Beamforming Algorithm and Its Application on Weak-target Detection .....	194
<i>Zhu Daizhu, Guo Haoquan</i>	
Defect Straw Inspection Method Based on Machine Vision.....	198
<i>Ying Zhu, Hui Zhang, Zhisheng Zhang, Zhijie Xia</i>	
Anti-Fatigue and Collision Avoidance Systems for Intelligent Vehicles with Ultrasonic and Li-Fi Sensors .....	203
<i>Yujie Li</i>	
Underwater Target Detection Based on Machine Learning.....	210
<i>Wen Zhang, Yanqun Wu, Yonggang Lin, Lina Ma, Kaifeng Han, Yu Chen, Chen Liu</i>	

## **Session 6—Pattern Recognition and Computer Vision**

Reduce sEMG channels for Hand Gesture Recognition .....	215
<i>Yali Qu, Haoyan Shang, Shenghua Teng</i>	
Real-Time Abnormal Event Detection in the Compressed Domain of CCTV Systems by LDA Model.....	221
<i>Abdou Khadre Diop</i>	
A robust matching algorithm for shape recognition based on geometric consistency .....	227
<i>Wei Wang, Jianhua Shi, Bing Lei, Jin Liu, Jia He</i>	
A robust traffic scene recognition algorithm based on deep learning and Markov localization .....	231
<i>Guoan Yang, Zirui Zhao, Zhengzhi Lu, Junjie Yang, Deyang Liu, Yong Yang, Chuanbo Zhou</i>	
Facial Expression Recognition Based on Sobel Operator and Improved CNN-SVM.....	236
<i>Sirui Liu, Xiaoyu Tang, Dong Wang</i>	
A Computer Vision Aided Beamforming Scheme with EM Exposure Control in Outdoor LOS Scenarios .	241
<i>Tianqi Xiang, Huiwen Li, Boren Guo, Xin Zhang</i>	
Visual Tracking Based On Matching Cascade .....	247
<i>Jialin Wang, Li Zhou, Weigang Lu, Fei Yang, Rui Zhang, Lei Zhang</i>	

Facial expression recognition using convolutional neural network with weighted loss function.....	252
<i>Jiawei Luan</i>	

## Session 7— Digital Image Analysis and Methods

A MR Image Denoising Algorithm based on Dictionary Learning with Minimax Concave Penalty.....	258
<i>Jianhao Tang, Chao Wan, Jiacheng Ling, Zhenni Li</i>	
An Optical-to-SAR Transformation Method for SAR Ship Image Augmentation.....	264
<i>Ke Li, Shenshen Luan, Dong Zhou</i>	
Robust Compressed Sensing based on Correntropy and Smoothly Clipped Absolute Deviation Penalty .....	269
<i>Le Gao, Xifeng Li, Dongjie Bi, Xuan Xie, Yongle Xie</i>	
Geometry-based Completed Local Binary Pattern for Texture Image Classification .....	274
<i>Wei Wang, Qiqi Kou, Shu Zhou, Ke Luo, Lifeng Zhang</i>	
A Hybrid Model Based on Inception Network and Conditional Random Fields for SAR Image Segmentation .....	279
<i>Yinyin Jiang, Ming Li, Peng Zhang, Xiaofeng Tan, Beibei Li</i>	
A Super Resolution Method for Remote Sensing Images Based on Cascaded Conditional Wasserstein GANs.....	284
<i>Bo Liu, Heng Li, Yutao Zhou, Yuqing Peng, Ahmed Elazab, Changmiao Wang</i>	
Welding Wires Centerline Detection Method Based on Image Gradient Segmentation.....	290
<i>Zeyu Yang, Dirong Yi</i>	

## Session 8— Image Processing and Application

Sparse Aperture Three-dimensional Reconstruction of Precession Target Based on Compressed Sensing .....	295
<i>Xingyu He, Weike Feng, Jun Li, Xiaoyue Ren</i>	
An Intra Complexity Reduction Algorithm for Quality Scalable SHVC .....	300
<i>Yong Li, Fukang Wang</i>	
Axisymmetric extended target tracking using Gaussian process.....	306
<i>Qinlei Li, Liping Song</i>	
24-point game based on BP neural network-A smart game designed for children.....	312
<i>Wu Jing, Mo Qiao, Chen Xiaowen, Yan Jihong</i>	
Land Cover Classification of Huixian Wetland Based on SAR and Optical Image Fusion .....	316
<i>Jianming Xiao, Yu Xiao, Xiyun Sun, Jianhua Huang, Haokun Wang</i>	

Anti Spatial Aliasing HOA Encoding Method based on Aliasing Projection Matrix.....	321
<i>Jing Lin, Xihong Wu, Tianshu Qu</i>	
A Reversible Meaningful Image Encryption Scheme Based on Block Compressive Sensing.....	326
<i>Liya Zhu, Xin Zhou, Xi Zhang</i>	
Index Modulation Based on Four-dimensional Spherical Code .....	331
<i>Jing Qu, Jun Zou, Jiyuan Sun, Meng Li and Chen Xu</i>	

## **Session 9— Communication Principle and Technology**

A Grouping Adaptive MIMO-OFDM Modulation Method for PLC .....	337
<i>Yingxue Li, Min Zhang, Xiao Feng Zhang, Guocheng Li, Jun Lu</i>	
RS-LDPC Concatenated Coding for NAND Flash Memory: Designs and Reduction of Short Cycles .....	342
<i>Weidong Zhang, Jing Kang, Zhenxing Dong, Yan Zhu</i>	
SimNet: Simplified Deep Neural Networks for OFDM Channel Estimation .....	348
<i>Yicheng Bao, Zeyu Tan, Haifeng Sun and Zhikang Jiang</i>	
Piecewise Fitting Technology of Group Delay Difference Based on Fourier Decomposition .....	353
<i>Fengyi Wang, Pengpeng Li, Weihua Mou, Shuibin Zhong and Shaojie Ni</i>	
An Efficient Correction Method of Direction Finding in Phased Array Reconnaissance System.....	359
<i>Wang Kun-da, Zhang Sheng-feng, Zhu Ye-teng, Zhong Wen</i>	
Joint User Selection and GMD-Based Hybrid Beamforming for Generalized Spatial Modulation Aided Millimeter-wave Massive MIMO Systems.....	364
<i>Taissir Y. Elganimi and Amani A. Aturki</i>	
Millimeter-Wave Massive MIMO Channel Estimation in Relay Environment.....	370
<i>Zhenghong Liu, Jing He, Yuanzhi Chen, Jianhe Du, Jiaqi Li</i>	
Evaluation of Channel Coding Techniques for Massive Machine-Type Communication in 5G Cellular Network .....	375
<i>Muhammad Huseen Khan, Gongxuan Zhang</i>	

## **Session 10— Wireless communication and Satellite Communication**

### **System**

Research on Indoor Positioning Algorithm Based on Neighborhood Partitioning.....	380
<i>Zhilong Shan, Fan Zhang, Na Lv, Wan Xiang</i>	
Rain Attenuation Analysis of Ka Band Ship-borne Satellite Communication Station in Indian Ocean and Pacific Ocean .....	385
<i>Jing Wang, Linhao Wang, Mingzhong Xu</i>	



A Spectrum Sensing Algorithm to Improve Detection Rates in Cognitive Radio Systems .....	389
<i>Jiahe Guo, Yi Guo, Chenjie Zhang, Xuemei Bai</i>	
Review of Prevention schemes for Replay Attack in Vehicular Ad hoc Networks (VANETs) .....	394
<i>Mahmood A. Al-shareeda, Mohammed Anbar, Iznan H. Hasbullah, Selvakumar Manickam, Nibras Abdullah, Mustafa Maad Hamdi</i>	
Analysis on the Influence of BeiDou Satellite Pseudorange Bias on Positioning .....	399
<i>Lei Li, Xiaohui Liu, Wei Xiao, Xiaomei Tang</i>	
Utilizing Drone for Food Quality and Safety Detection using Wireless Sensors.....	405
<i>Faris. A. Almalki</i>	
Research on Near-far Effect and anti-impact noise interference pseudo-code sequence blind estimation algorithm in Pseudo Satellite System .....	413
<i>Youming Li, Jinpeng Gao, Yuanfa Ji, Wentao Fu, Songke Zhao, Suqing Yan</i>	
Research on Campus Network Based on QoS Technology.....	418
<i>JiaHao Xue, Yue Wu, Jun Tao, YunLing Zhang</i>	

## **Session 11— Electronics and Communication Engineering**

Network Traffic Forecasting Based on Logistic Iterative Regression Model .....	424
<i>Zhang Jianjun, Xue Yuanbiao, Feng Renhai</i>	
Compound Model of Navigation Interference Recognition Based on Deep Sparse Denoising Auto-encoder.. ..	430
<i>Zhen Xu, Zhen-yu Wu</i>	
A method of Missile-borne Forward-looking Compound Angle Measurement.....	436
<i>Honghua Chi, Xingzhao Liu, Yesheng Gao</i>	
ADS-B system Based on SDN and ISIS.....	440
<i>Jun Tao, Zhi Bing Yan, Min Du, Yang Shen</i>	
A Fabry-Perot interferometer demodulation method based on correlation detection .....	445
<i>Jun Hu, Ming Rui Fu</i>	
Directional Modulation-Enabled Secure Transmission with Intelligent Reflecting Surface.....	450
<i>Liangling Lai, Jinsong Hu, Youjia Chen, Haifeng Zheng, and Nan Yang</i>	
DNN-Based Decoder for Four-Dimensional Modulation Superposition NOMA .....	454
<i>Meng Li, Jun Zou and Jiyuan Sun</i>	
Measuring Similarity in CCTV Systems for a Real-time Assessment of Traffic Jams.....	460
<i>Abdou Khadre DIOP, Amadou Dahirou Gueye, Khaly Tall, Sidi Mohamed Farssi</i>	

## Session 12— Computer and Data Engineering

Intercomparison between the satellite and Drifter observed sea surface temperature in East/Japan Sea .....	465
<i>Shiyao Chen, Haodi Wang, Ning Wang, Peilong Yu, Xiao Yang, Benhong Wang, Yongchui Zhang</i>	
Fault Tolerant Model for Redundant System Based on Health Assessment.....	470
<i>Tao Wang, Jian Cao, Yingbiao Luo, Wenyu Sun, Ying Zhang, Yuan Wang</i>	
Development of Laravel Digital Platform Based on MVC Design Pattern for Compli cated Data Structure-Take the Bible for Example .....	475
<i>Chao-Hsien Hsieh, Changfeng Li, Ziyi Wang, Chih-Horng Ke</i>	
A Scheme for RAID-6 Scaling Based on N-code .....	481
<i>Yu Hu, Ping Xie, MuYuan Li, Defang Wang, Shengling Geng</i>	
Evaluation of multi-model current data in the East/Japan Sea .....	486
<i>Haodi Wang, Shiyao Chen, Ning Wang, Peilong Yu, Xiao Yang, Yang Wang, Yongchui Zhang</i>	
Research on Rapid extraction of Android Backup Data based on UI-Automator .....	492
<i>Shan jun Liu, Song yang Wu, Ying Zhang, Qian Luo</i>	
Construction of word level Tibetan Lip Reading Dataset .....	497
<i>Zhenye Gan, Hao Zeng, Hongwu Yang, Shihua Zhou</i>	
Application of VMD in Fault Diagnosis for Rotor-Bearing System with Rub-Impact.....	502
<i>Rui Zhu, Xin Xia</i>	