PROCEEDINGS OF SPIE

International Conference on Signal Processing and Communication Technology (SPCT 2022)

Shuwen Xu
Sandeep Saxena
Editors

23–25 December 2022
Harbin, China

Organized by
Xidian University (China)

Sponsored by
Greater Noida Institute of Technology (GNIOT) (India)
AEIC Academic Exchange Information Centre (China)

Published by
SPIE

Volume 12615

Proceedings of SPIE 0277-786X, V. 12615

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIEDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings:
Author(s), "Title of Paper," in *International Conference on Signal Processing and Communication Technology (SPCT 2022)*, edited by Shuwen Xu, Sandeep Saxena, Proc. of SPIE 12615, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X
ISSN: 1996-756X (electronic)

ISBN: 9781510664333
ISBN: 9781510664340 (electronic)

Published by
SPIE
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time)
SPIE.org
Copyright © 2023 Society of Photo-Optical Instrumentation Engineers (SPIE).

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.

SPIE. DIGITAL LIBRARY
SPIEDigitalLibrary.org

Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B … 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

Contents

ix *Conference Committee*

DIGITAL SIGNAL PROCESSING AND IMAGE CODING

12615 02 **Color transfer based on cartoon decomposition and efficient illuminant estimation** [12615-10]

12615 03 **The application of automatic power control based on FPGA in digital remote unit** [12615-38]

12615 04 **Image compression and encryption algorithm via deep compressed sensing** [12615-21]

12615 05 **Multi-task encoder with attention mechanism to remove noise from GPR signal** [12615-39]

12615 06 **Motor imagery classification of finger movements based on position subtask network learning** [12615-64]

12615 07 **Cascaded MZM based optical frequency comb generation** [12615-34]

12615 08 **Sorting method of radar signal batch processing** [12615-57]

12615 09 **Contrast preserving decolorization method under gradient domain global mapping** [12615-75]

12615 0A **The research on noise reduction of ground target vibration signal based on wavelet decomposition and EMD** [12615-84]

12615 0B **Image hiding via compressed sensing and frequency domain transform** [12615-40]

12615 0C **Unknown radar signal recognition based on deep metric learning** [12615-6]

12615 0D **Swin-transformer based target detection with enhanced maritime SAR images data** [12615-55]

12615 0E **Positioning and defense of UAV detection signal based on software radio** [12615-110]

12615 0F **Combined intrinsic decomposition and histogram matching for color migration** [12615-86]

12615 0G **ECG signal denoising algorithm based on wavelet transform** [12615-7]

12615 0H **A useful method of signal de-noising** [12615-44]

12615 0I **The DOA and polarization estimation of coherent signals via UCA-IEVS** [12615-50]

12615 0J **Extracting the columns of Gong-che musical score based on cluster analysis** [12615-97]

12615 0K **A method of photoelectric ship image detection based on improved SSD** [12615-71]

12615 0L **Automatic modulation classification of frequency hopping signals based on decision-level fusion model in multipath channels** [12615-18]

12615 0M **Accurate time-delay estimation algorithm for ADS-B signal in radar systematic bias calibration** [12615-103]

12615 0N **Residual dense network for image compression sensing** [12615-42]

12615 0O **Modeling and analysis of K-tier heterogeneous cellular networks based on matern cluster processes** [12615-9]

12615 0P **Magnetic resonance image reconstruction based on graph convolutional Unet network** [12615-65]

12615 0Q **Analysis on high-frequency vibration characteristics of complex blades under ultrasonic excitation** [12615-70]

12615 0R **Hardware-in-the-loop simulation research on cooling effect of different modulated waveform signals with vacuum optical trap parameter feedback** [12615-4]

12615 0S **Research on radar signal source identification method based on deep learning** [12615-107]

12615 0T **Research and significance of DC switch acquisition board in railway signal training system** [12615-8]

12615 0U **Digital twin-based 5G+ longitudinal differential protection method** [12615-30]

12615 0V **Internet of vehicles and digital twin framework for unmanned tracked vehicles based on 5G communication** [12615-3]

12615 0W **A comparative analysis of mathematical transformations for signal processing** [12615-29]

12615 0X **Intelligent traffic signal coordination control method based on YOLOv3 and DQN** [12615-43]

12615 0Y **Research and application of strategies to improve signal system operation capacity of turn-back station of urban rail transit under multiple constraints** [12615-46]

12615 0Z **Speech aerodynamic model analysis of mono stop initials in Xiahe dialect** [12615-5]

12615 10 **Analysis of key technologies for airborne conformal arrays radar system** [12615-28]

12615 11 **Joint optimization of position and beamforming vectors in UAV-assisted wireless communication system** [12615-56]

12615 12 **A SIFT registration and modified CNN model-based human eye detection and location algorithm** [12615-82]

12615 13 **A single-inductor thermoelectric, photovoltaic and vibration triple-source energy-harvesting power management system** [12615-35]

12615 14 **Photoelectric direction finding and positioning technology based on high-precision Beidou** [12615-58]

12615 15 **Does vortex beam improve the channel capacity in line-of-sight based MIMO scenario?** [12615-99]

12615 16 **A rapid suppression technique for electromagnetic interference of electromagnetic detector** [12615-100]

12615 17 **Measurement error correction method of electric power meter based on T distribution test** [12615-94]

12615 18 **Research on an accurate passive location algorithm based on the underwater target acoustic-magnetic fusion in the near field** [12615-47]

12615 19 **Variable forgetting factor RLS algorithm for mobile single carrier SIMO underwater acoustic communication** [12615-98]

12615 1A **Research on indoor positioning application system based on WIFI mobile terminal** [12615-32]

12615 1B **Analysis of antenna cross polarization effects in phase comparison monopulse radar** [12615-77]

12615 1C **Optimal power allocation for cooperative localization in UAV swarms** [12615-15]

12615 1D **POWERLINK communication fault detection method based on data frames sequence analysis** [12615-61]

12615 1E **Effect of Bellhop-based mesoscale ocean front and topography on deep-sea communication and detection** [12615-72]

12615 1F **Data encryption transmission method of communication network based on RSA algorithm** [12615-73]

12615 1G **Power allocation optimization method for radar networking system based on sequential convex programming** [12615-23]

12615 1H **GPS/IMU fusion localization based on attention-LSTM networks and sliding windows** [12615-85]

12615 1I **A new OTFS channel estimation technique under high maneuvering conditions** [12615-62]

12615 1J **A high isolated antenna array with the combined cancelling-type structure** [12615-68]

12615 1K **Research and design on surface movement radar based on moving target detection technology** [12615-36]

12615 1L **Research on shutter-less non-uniformity correction technology based on ambient temperature** [12615-79]

12615 1M **Communication waveform parameter decision based on reinforcement learning** [12615-12]

12615 1N **Research and application of end-to-end pig speech recognition model** [12615-105]

12615 1O **Design and research of underwater acoustic communication system** [12615-108]

12615 1P **Research on the application of electronic information system in communication satellite platform** [12615-106]

12615 1Q **Transmission line monitoring system based on a space-space integration network and BeiDou short message** [12615-95]

12615 1R **Analysis of common wiring errors of operation box** [12615-51]

12615 1S **A method for rapidly measuring the static parameter of a digital-to-analog converter** [12615-31]

12615 1T **Research on temperature compensation method of bursting disc** [12615-102]

12615 1U **A new test method for digital-to-analog converter** [12615-74]

12615 1V **Extractions of components in the seabed seismic wave excited by underwater acoustic sources in shallow water by the improved time domain polarization analysis** [12615-89]

MOBILE LEARNING AND BIG DATA ALGORITHM

12615 1W **FBLSTM: A Filter-Bank LSTM-based deep learning method for MI-EEG classification** [12615-67]

12615 1X **LocPatcH: An efficient long-read hybrid error correction algorithm based on local pHMM** [12615-91]

12615 1Y **Research on industrial internet intrusion detection model based on optimized BI-GRU** [12615-33]

12615 1Z **Intelligent collection system of human resource information based on clustering algorithm** [12615-83]

12615 20 **Prediction for passenger throughput of the western regional airport based on multiple stepwise regression-gray model** [12615-60]

12615 21 **Research on correction algorithm of 2D IAA dictionary to eliminate off-grid effect** [12615-45]

12615 22 **Hybrid reconfiguration strategy for optimize service cost in NFV environment** [12615-16]

12615 23 **Radar waveform design based on improved particle swarm optimization algorithm** [12615-41]

12615 24 **DOA and polarization parameter estimation algorithm based on L-shaped coprime array** [12615-52]

12615 25 **Solving constrained path problem based on improved recurrent neural network** [12615-59]

12615 26 **A new CPM demodulation algorithm based on tilted-phase and posteriori probability** [12615-20]

12615 27 **Dot-shaped range-angle beamforming of frequency diverse array using adaptive genetic algorithm based thinned array** [12615-54]

12615 28 **Research on STAP matrix fusion algorithm based on LMS** [12615-49]

12615 29 **Ultra-wideband radar target recognition algorithm based on edge detection and region segmentation** [12615-11]

12615 2A **Anti-occlusion target tracking algorithm based on correlation filter architecture** [12615-69]

12615 2B **Review of unmanned cluster routing protocols based on deep reinforcement learning** [12615-22]

12615 2C **Bearing fault feature extraction method based on improved empirical wavelet transform and unbiased autocorrelation** [12615-87]

12615 2D **Performance analysis of forward-looking imaging algorithm for array radar** [12615-80]

12615 2E **Analysis of the implementation method of network security in the logical security domain of edge power secondary integration equipment** [12615-96]

12615 2F **Optimal jamming method based on grey wolf optimization and orthogonal decomposition** [12615-14]

12615 2G **Intrusion detection model based on genetic algorithm optimization extreme learning machine of K-fold stratified cross-validation** [12615-17]

12615 2H **Adaptive grayscale method based on weighted guided filtering** [12615-13]

12615 2I **Self-training algorithm for power transformer anomaly sound detection with supercomputing platform** [12615-101]

12615 2J **Integrated method of synaesthesia in internet of things for power distribution maintenance** [12615-2]

12615 2K **Simulation of secondary sound field produced by annular parametric array based on Gaussian beam expansion** [12615-53]