

PROCEEDINGS OF SPIE

Second International Conference on Electrical, Electronics, and Information Engineering (EEIE 2023)

**Tania Limongi
Hong Lin**
Editors

**2–4 November 2023
Wuhan, China**

Organized by
Nanchang Institute of Technology (China)
Hubei Zhongke Institute of Geology and Environment Technology (China)

Sponsored by
American Society for Science and Technology (USA)

Published by
SPIE

Volume 12983

Proceedings of SPIE 0277-786X, V. 12983

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 SPIDigitalLibrary.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 *Second International Conference on Electrical, Electronics, and Information Engineering (EEIE 2023)*, edited by Tania Limongi, Hong Lin, Proc. of SPIE 12983, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510672840

ISBN: 9781510672857 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2024 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**

SPIDigitalLibrary.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*

SECOND INTERNATIONAL CONFERENCE ON ELECTRICAL, ELECTRONICS, AND INFORMATION ENGINEERING (EEIE 2023)

- 12983 02 **Design of DC-18 GHz high-isolation and high-power SPDT** [12983-2]
- 12983 03 **Ultra-wideband 180° active digital phase-shifting unit design** [12983-3]
- 12983 04 **AI and neuron network-based computation method for cardiovascular data and related computation problems** [12983-4]
- 12983 05 **Research on dynamic strain of fan blade based on DIC technology** [12983-7]
- 12983 06 **Influence of pressure on the stability, electronic properties and elastic properties of TaC** [12983-8]
- 12983 07 **Aviation industry clusters and embedded interaction simulation research based on system dynamics** [12983-9]
- 12983 08 **Transformer multimodal data and knowledge encoding method based on attention model** [12983-10]
- 12983 09 **Corrosion resistance behavior of weathering GR65 steel under marine and industrial atmospheric environment** [12983-11]
- 12983 0A **Distributed DC chopper and its control method for offshore wind farm via VSC-HVDC** [12983-12]
- 12983 0B **A coordinated control strategy for fault ride-through of offshore wind power flexible DC grid-connected system** [12983-14]
- 12983 0C **A diversity-based deployment method of high robustness in SDN control planes** [12983-15]
- 12983 0D **Negative differential transconductance in conventional heterojunction TFET** [12983-16]
- 12983 0E **Study on integrated intelligent equipment for crushing and disposal of used railway sleepers** [12983-17]
- 12983 0F **Design and implementation of interactive virtual shows** [12983-18]
- 12983 0G **Research on forecasting the development of counties and cities in Jilin province based on data mining algorithms** [12983-19]

- 12983 OH **Research on plasma disassembly technology of scrapped railway wagons for green manufacturing** [12983-20]
- 12983 OI **Experimental study on microalgae inactivation in marine ballast water by microbubbles** [12983-21]
- 12983 OJ **Research on residual vibration suppression of the autonomous refueling crane for tank truck** [12983-22]
- 12983 OK **Design of ultra-wideband large dynamic range logarithmic linear detector** [12983-24]
- 12983 OL **Joint sparse recovery condition via orthogonal matching pursuit** [12983-25]
- 12983 OM **Advancing machine learning tasks with field-programmable gate arrays: advantages, applications, challenges, and future perspectives** [12983-26]
- 12983 ON **The contribution from electrical and electronic engineering to environmental protection** [12983-27]
- 12983 OO **Analysis and research of cognitive OODA ring on emergency distributed command and control** [12983-28]
- 12983 OP **Design of the PPG signal acquisition circuit** [12983-30]
- 12983 OQ **Cognitive radar waveform design based on PCMA-ES algorithms** [12983-31]
- 12983 OR **Multi-feature optimization of QSPR model for fuel octane number** [12983-32]
- 12983 OS **A mobile financial reimbursement information collection system based on OCR** [12983-33]
- 12983 OT **Key driving factors research of power grid investment effectiveness considering the cost of project** [12983-34]
- 12983 OU **Read-out circuit design of the X-ray detector** [12983-35]
- 12983 OV **Analysis and reduction of high frequency circulating current in multi-machine parallel UPQC system** [12983-36]
- 12983 OW **Study on the preparation of functional pearl nanofiber and its application** [12983-37]
- 12983 OX **Low-power off-chip capacitor-free LDO design with high transient response** [12983-38]
- 12983 OY **Pressure effect on bonding of advanced carbon-based coatings under high temperature** [12983-39]
- 12983 OZ **A PCL-based machine vision fast ranging method** [12983-41]
- 12983 IO **Spatial resolution enhancement method for hyperspectral image based on spatial-spectral feature fusion** [12983-43]

- 12983 11 **Preparation of high crystalline YBCO superconducting thin films by PLD** [12983-44]
- 12983 12 **Research on entity relations extraction based on deep learning** [12983-45]
- 12983 13 **Research on autonomous solution methods for unmanned autonomous systems considering performance constraints** [12983-46]
- 12983 14 **Error analysis based on the technology of multiple sub-band signal splicing in range direction** [12983-48]
- 12983 15 **Design of an emergency response system based on the risk of "personnel adsorption" in negative pressure gas flow standard devices** [12983-49]
- 12983 16 **Dual granularity multi-layer attention networks for group event recommendation** [12983-50]
- 12983 17 **Design of TD-LTE ground-to-air network for general aviation** [12983-51]
- 12983 18 **Analytical of different kinds of zanthoxylum bungeanum by fourier transform infrared spectroscopy** [12983-52]
- 12983 19 **Analysis of water hammer advance protection system for a product oil pipeline** [12983-54]
- 12983 1A **The design of RTU valve room distribution protection system for long distance natural gas pipeline based on PLC** [12983-55]
- 12983 1B **Airborne strain testing techniques based on digital speckle images** [12983-56]
- 12983 1C **Design of three-dimensional display system based on nano luminescent crystal materials** [12983-58]
- 12983 1D **Efficiency analysis of motor by B method at different voltages** [12983-59]
- 12983 1E **Study on the heat exchange of buried pipes with soil seepage** [12983-60]
- 12983 1F **Determine the exact value of the square root of 2** [12983-61]
- 12983 1G **Design characteristics analysis of RTVO for a nuclear power plant** [12983-62]
- 12983 1H **Research on data asset pricing optimization model considering risk factors** [12983-63]
- 12983 1I **Impact of carbon cost sharing on transmission and distribution electricity prices** [12983-64]
- 12983 1J **ESG-based investment evaluation framework for distribution network projects** [12983-65]
- 12983 1K **The stability study of time-delay system based on Lyapunov-Razumikhn** [12983-66]
- 12983 1L **Aberration theory and applications of single aspherical mirror** [12983-67]

- 12983 1M **Optimal control algorithm for optical path scanning control system based on relative performance error** [12983-68]
- 12983 1N **Comparison of the characteristics of two modulated dual-stator brushless doubly-fed generators for wind turbine** [12983-69]
- 12983 1O **Advances in image denoising techniques: a comprehensive review** [12983-70]
- 12983 1P **Research on infrared image classification algorithm based on improved KNN** [12983-72]
- 12983 1Q **Research on neural network temperature compensation for embedded weighing systems** [12983-73]
- 12983 1R **Using total station and spatial analyzer software to construct high precision industrial survey system** [12983-75]
- 12983 1S **High temperature optical fiber temperature sensor based on blackbody thermal radiation** [12983-76]
- 12983 1T **All-optical tuned optical micro-mushroom cavity resonance wavelength** [12983-77]
- 12983 1U **Design of lane offset recognition system based on surface array camera sensor** [12983-78]
- 12983 1V **Design and implementation of high-precision power harmonics detection system based FFT-FT** [12983-79]
- 12983 1W **Fusion learning methods for the age-related macular degeneration diagnosis based on multiple sources of ophthalmic digital images** [12983-80]
- 12983 1X **Design and parameter optimization of rifle spring buffer based on multi-objective particle swarm optimization** [12983-81]
- 12983 1Y **Exploring effects of color contrast on readability of mobile navigation interface in riding scenario** [12983-82]
- 12983 1Z **Deep learning for macular fovea detection based on ultra-widefield fundus images** [12983-83]
- 12983 20 **Energy consumption optimization of the auxiliary resonant commutated pole inverter with single inductor** [12983-85]
- 12983 21 **Improving strategies for educational imbalance based on large language model** [12983-86]
- 12983 22 **A trajectory planning method based on triggered planning framework for autonomous driving on unstructured roads in mining areas** [12983-87]
- 12983 23 **Temperature field analysis of the gun barrel of a new machine gun** [12983-88]
- 12983 24 **Application research on ALBP image recognition algorithm in visual aid system for deaf people** [12983-90]

- 12983 25 **Analysis of overvoltage characteristics considering different values of three-phase closing resistor of circuit breakers** [12983-91]
- 12983 26 **Changing trends of soil fungal communities in the western foot of the Greater Khingan Mountains under drought stress** [12983-92]
- 12983 27 **Indirect adaptive admittance control based on position synchronization of robot-assisted nasopharyngeal surgery** [12983-93]
- 12983 28 **Force measurement using a multi-section mechatronic module for localization of the patient's support areas during the formation of his spatial position** [12983-96]
- 12983 29 **Matching characteristic analysis between the MicroRNA sequences and their target gene mRNA sequences** [12983-97]
- 12983 2A **Research on dynamic matching technology of Class EF high frequency inverter in wireless charging system** [12983-98]
- 12983 2B **Analysis and prevention of partial discharge defects in handover test of GIS** [12983-99]
- 12983 2C **GIS basin insulator partial discharge measurement system based on photoelectric joint** [12983-100]
- 12983 2D **Experimental research on heat treatment process and performance of GCr15 steel bearing ring for new energy vehicle drive motor** [12983-101]
- 12983 2E **Improvement of bearing structure of high speed drive motor and its performance test** [12983-102]
- 12983 2F **Vibration analysis and simulation of the helical gear of the rotary shuttle of twin-needle high speed lockstitches** [12983-103]
- 12983 2G **Bearings-only target motion analysis with nonlinear inequality constraints using two arrays** [12983-105]
- 12983 2H **An improved YOLOv5 for identifying pigs postures** [12983-106]
- 12983 2I **Dynamical analysis of the Solow model with time delay and pollution** [12983-108]
- 12983 2J **Research of the Hanoi Tower based on computational thinking** [12983-109]
- 12983 2K **Research on MIMU calibration method with unified model based on least squares estimation** [12983-114]
- 12983 2L **Compliance method of electrical ignition protection for transport aircraft fire safety** [12983-115]
- 12983 2M **Research on association rule mining of specialty industries based on apriori algorithm** [12983-118]
- 12983 2N **Multilevel effects of factors influencing passenger flow in urban rail transit stations based on spatial metrology model** [12983-119]

- 12983 2O **Secondary electron emission and spacecraft surface charging** [12983-120]
- 12983 2P **A new power supply with resonant converter** [12983-122]
- 12983 2Q **Experimental study on prefabrication and tensile test of basalt reinforcement** [12983-123]