# PROCEEDINGS OF SPIE

# Asia Conference on Electronic Technology (ACET 2024)

**Xudong Jiang** *Editor* 

8–10 March 2024 Singapore

Organized by Singapore Institute of Electronics (Singapore)

Published by SPIE

**Volume 13211** 

Proceedings of SPIE 0277-786X, V. 13211

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 *Asia Conference on Electronic Technology (ACET 2024)*, edited by Xudong Jiang, Proc. of SPIE 13211, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510681361

ISBN: 9781510681378 (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.



**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**

#### Conference Committee

#### ASIA CONFERENCE ON ELECTRONIC TECHNOLOGY

Modulation type recognition of MIMO radar based on FrFT and instantaneous frequency extraction [13211-2]

Design based on the health detection technology of young children [13211-7]

A vibration monitoring signal processing method for shunt reactor [13211-16]

A comparative study of deep learning models for image super-resolution [13211-5]

Semantic segmentation for scene modeling of mobile robots based on improved DeepLabV3+ [13211-17]

Fabrication of high-performance broadband photodetectors using 1D-2D hybrid electronic materials for IoT applications [13211-4]

Enhancement and optimization of the propulsion system modules of unmanned aerial vehicles [13211-1]

Active space debris detection, capture, and storage system [13211-18]

Measurement study of UHF local discharge based on voltage division method [13211-14]

Accurate nonlinear capacitance measurement based on frequency response compensation [13211-3]

Improved breakdown voltage and threshold voltage in normally-off p-GaN HEMT with L-shape gate metal and MIS structure [13211-6]

Function development for self-localization through sensor data fusion for autonomous vehicles [13211-12]

Overcoming sub-threshold swing degradation in sub 10 nm technologies [13211-9]

## **Conference Committee**

#### Conference Chairs

**Xudong Jiang**, Nanyang Technological University (Singapore) **Yuhua Cheng**, Peking University (China)

#### **Program Chairs**

 Dong Hwa Kim, Hanbat National University (South Korea)
Xunqing Shi, Hong Kong Applied Science and Technology Research Institute Company Ltd. (China)
Xiaohang Wang, Zhejiang University (China)

#### Program Co-chairs

**Lifeng Liu**, Peking University (China) **Hua Fan**, University of Electronic Science and Technology of China (China)

#### Industry Liaison Chair

Gang Wu, HangZhou Speedcury Technology Company Ltd. (China)

#### **Publication Chair**

Jianjun Gao, East China Normal University (China)

#### **Award Chairs**

**Jianjun Zhou**, Shanghai Jiao Tong University (China) **Wenhui Zhu**, Central South University (China)

#### **Publicity Chairs**

Teo Tee Hui, Singapore University of Technology and Design (Singapore)Lele Jiang, Peking University (China)Xiangpeng Liu, Shanghai Normal University (China)

#### Technical Program Committees

**Xiao Long**, Minnan University of Science and Technology (China) **Issa Etier**, Hashemite University (Jordan) **Kazunori Mizuno**, Japan Takushoku University (Japan)

Vimlesh Verma, National Institute of Technology Patna (India)

Teruo Suzuki, Socionext (Japan)

**Yanhui Zhang**, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences (China)

**Qian He**, University of Electronic Science and Technology of China (China)

Mei Wang, Guilin University of Technology (China)

**Dongxu Yang**, University of Texas Southwestern Medical Center (United States)

Reza Ahmadi Kordkheili, University of Southern Denmark (Denmark)

Adam W. Skorek, University of Quebec (Canada)

**Grigoras Gheorghe**, "Gheorghe Asachi" Technical University of Iasi (Romania)

Mei Jiang, Shenzhen University (China)

**Bo Jiang**, Omni Vision Technologies (United States)

Chunyu Peng, Anhui University (China)

**Xiangxian Zhou**, State Grid Zhejiang Electric Power Research Institute Hangzhou (China)

Yu Zhou, Hainan Normal University (China)

Chen Liu, Xidian University (China)

Yu Lu, Shenzhen Technology University (China)

**Somchat Sonasang**, Nakhon Phanom University (Thailand)

Arezki BENFDILA, Mouloud Mammeri University (Algeria)

Eng-Hock Lim, Universiti Tunku Abdul Rahman (Malaysia)

Fei Cao, Xi'an Research Institute of High Technology (China)

**Guangnan Zhou**, Crosslight Software Inc. (Canada)

Henri Uranus, University of Pelita Harapan (Indonesia)

Janelli M. Mendez, Lorma Colleges – Carlatan Campus (Philippines)

Jian Zhu, Nanjing University (China)

**Kai Wang**, Southern University of Science and Technology (China)

**Yuqian Yang**, State Key Laboratory of Space-Ground Integrated Information Technology (China)

Manuel Costa, University of Minho (Portugal)

Pei-Song Chee, Universiti Tunku Abdul Rahman Selangor (Malaysia)

**Wen-Sheng Zhao**, Hangzhou Dianzi University (China)

**Yan Lin**, China Information Consulting & Designing Institute Company Ltd. (China)

**Yongbo Liao**, University of Electronic Science and Technology of China (China)

Yu Hongyu, Southern University of Science and Technology (China)

Yu Xiao, Sun Yat-Sen University (China)

Chikong Wong, The University of Macau (China)

Kanthi Hegde, Manipal University (India)