

PROCEEDINGS OF SPIE

Second International Conference on Industrial IoT, Big Data, and Supply Chain

**Victor Chang
Yongxin Zhu
Hong Yu**
Editors

**15–17 October 2021
Online Only, Macao, China**

Sponsored and Organized by
Hunan University of Finance and Economics (China)

Published by
SPIE

Volume 12128

Proceedings of SPIE 0277-786X, V. 12128

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 Industrial IoT, Big Data, and Supply Chain*, edited by Victor Chang, Yongxin Zhu, Hong Yu, Proc. of SPIE 12128, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510651326

ISBN: 9781510651333 (electronic)

Published by

SPIE

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

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2021 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

SESSION 1 INDUSTRIAL INTERNET OF THINGS (IIOT) FUNDAMENTALS AND APPLICATIONS

- 12128 02 **Application of multi-axis fatigue life analysis method in mechanical structure of aircraft**
[12128-36]
- 12128 03 **User's balanced evaluation of sensitive influence based on time factor** [12128-56]
- 12128 04 **The cross-section yielding of bonds based on machine learning** [12128-65]
- 12128 05 **Design and exploration of digital fitness equipment based on Internet of Things** [12128-8]
- 12128 06 **Review of RFID security technology** [12128-21]
- 12128 07 **An attribute based encryption scheme with supervision of IoT devices in 5G cloud and fog environment** [12128-16]
- 12128 08 **An algorithm for sheep contour extraction** [12128-25]
- 12128 09 **Application analysis of integrated intelligent gateway for power Internet of Things based on substation ubiquitous** [12128-32]
- 12128 0A **Research and implementation of vulnerability detection system for power plant industrial control network** [12128-7]
- 12128 0B **Incomplete vehicle information completion using generative adversarial network to enhance the safety of autonomous driving** [12128-4]
- 12128 0C **The trade-off between the centralized and mobile edge-based cloud solutions for IoT applications** [12128-13]

SESSION 2 BIG DATA RESEARCH AND MULTI-DISCIPLINE SERVICES

- 12128 0D **Research on the framework construction of the big data algorithm in the financial credit investigation system** [12128-48]
- 12128 0E **Realization path of comprehensive value of social impact investment based on big data**
[12128-50]
- 12128 0F **Analysis of high quality customer identification and marketing service strategy based on big data** [12128-51]
- 12128 0G **Research on electronic evidence collection in the investigation of duty crime based on big data** [12128-52]

- 12128 OH **Application of big data analysis in economic statistics** [12128-57]
- 12128 OI **Study on the willingness behavior of financial market based on clustering algorithm** [12128-60]
- 12128 OJ **Research on education information management platform based on big data** [12128-61]
- 12128 OK **The situation solution of land combat multi-platform concealed guerrilla warfare** [12128-20]
- 12128 OL **Deep hash image retrieval based on supervised semantic preservation** [12128-14]
- 12128 OM **Adaptive method for complete random forest** [12128-27]
- 12128 ON **A review of research on application of remote sensing in lake water quality monitoring**
[12128-47]
- 12128 OO **Research on financial time series forecasting model based on big data analysis** [12128-33]
- 12128 OP **A neighborhood rough set model for attribute reduction without distance metric** [12128-9]
- 12128 OQ **Policy instruments for livestreaming e-commerce in China: a quantitative analysis** [12128-31]
- 12128 OR **Intelligent tax planning model of aircraft leasing based on big data mining algorithm**
[12128-34]
- 12128 OS **Marketing effect modeling analysis of fan economy based on random forest algorithm**
[12128-35]
- 12128 OT **Ethical discussions for autonomous robotic surgeries (Invited Paper)** [12128-1]
- 12128 OU **Investor's sentiment and non-life insurance demand during economic impairment: a big dataset analysis** [12128-15]
- 12128 OV **A method of adaptive filtering and learning based on label noise** [12128-12]
- 12128 OW **BLSTM-based source code vulnerability detection visualization system** [12128-18]
- 12128 OX **Research on precision marketing strategies of e-commerce under big data environment**
[12128-39]
- 12128 OY **Ethical issues with development status of modern agricultural production (Invited Paper)**
[12128-3]
- 12128 OZ **MSANet: Multi-scale attention guided deep neural network for blind image quality assessment**
[12128-10]
- 12128 IO **Research on fault diagnosis structure of TCAS system** [12128-41]

SESSION 3 SUPPLY CHAIN FUNDAMENTALS

- 12128 11 **An empirical study on the influence of Gansu foreign trade scale on economic growth**
[12128-37]
- 12128 12 **Discussion and construction of economic value added in banking performance appraisal**
[12128-42]
- 12128 13 **Dimension analysis and role analysis of enterprise brand image** [12128-49]
- 12128 14 **Empirical analysis of poor population and industrial economic growth based on joint cubic equation model** [12128-58]
- 12128 15 **Dynamic analysis of the prediction of financial difficulties in enterprise financial management**
[12128-59]
- 12128 16 **Credit risk assessment and strategy formulation of MSMes** [12128-62]
- 12128 17 **Retrospect and prospect of emergency logistics in China** [12128-22]
- 12128 18 **Study on the development strategy of smart logistics in China** [12128-24]
- 12128 19 **Research on the evolution, current situation and development strategy of wisdom logistics service in China under the background of internet** [12128-23]

SESSION 4 ADVANCED SUPPLY CHAIN AND IIOT-BD INTEGRATION

- 12128 1A **Design of enterprise management system based on cluster algorithm** [12128-66]
- 12128 1B **The application of big data algorithm in the intelligent manufacturing supply chain wisdom embodiment** [12128-55]
- 12128 1C **Research on financial risk early warning of listed companies based on neural network**
[12128-64]
- 12128 1D **Supply chain financial risk and influence under Internet of Things technology** [12128-2]
- 12128 1E **Analysis on the impact mechanism of business environment on the use of foreign capital in Guangdong-Hong Kong-Macao Greater Bay Area** [12128-29]

SESSION 5 EMERGING AREAS: EDUCATION AND EMERGING APPLICATIONS

- 12128 1F **Research on online ideological and political teaching system based on web** [12128-53]
- 12128 1G **On the teaching mode of personalizing reading under the background of "internet+"** [12128-54]

- 12128 1H **Design and implementation of campus pick-up express APP** [12128-63]
- 12128 1I **Analysis on the evaluation methods and suggestions of higher education** [12128-67]
- 12128 1J **Research on the tactics and strategy of information creating wealth** [12128-28]
- 12128 1K **Comment on “Flexible ultra-wideband microwave metamaterial absorber with multiple perfect absorption peaks based on the split square ring”** [12128-11]
- 12128 1L **Design of practical teaching quality evaluation system based on rough set and big data mining** [12128-19]