PROCEEDINGS OF SPIE

International Conference on Intelligent Systems, Communications, and Computer Networks (ISCCN 2023)

Xiaogang Liu Lin Wang Editors

24–26 February 2023 Changsha, China

Organized by Wuhan University of Technology (China)

Sponsored by AEIC Academic Exchange Information Centre (China)

Published by SPIE

Volume 12702

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 Intelligent Systems, Communications, and Computer Networks (ISCCN 2023)*, edited by Xiaogang Liu, Lin Wang, Proc. of SPIE 12702, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510666238

ISBN: 9781510666245 (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.



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

INTELLIGENT SECURITY SYSTEM DESIGN, MEASUREMENT, AND CONTROL

	INTELLIGENT SECURITY SYSTEM DESIGN, MEASUREMENT, AND CONTROL
12702 02	Design and construction of medicinal plant planting management information system based on WebGIS [12702-104]
12702 03	Intelligent street lamp control system based on LSTM and Bayesian optimization [12702-110]
12702 04	Digital intelligent pharmacy system [12702-84]
12702 05	Research on 3D printing control system [12702-4]
12702 06	Design of context-based healthy catering O2O recommendation system [12702-114]
12702 07	Design of double layer rotatable smart garage system [12702-27]
12702 08	An architecture design of intelligent task planning system for precision strike ammunition [12702-70]
12702 09	Cloud-based monitoring and controlling system for the growth environment of multi-variety vegetable plant factories [12702-47]
12702 0A	Noncontact vital signs detection system with high dynamic adjustment range for vehicle occupants [12702-111]
12702 OB	Production and operation decision support system of manufacturing enterprise based on data warehouse [12702-83]
12702 OC	Application of digital monitoring system for pile drivers in airport construction [12702-76]
12702 0D	An IoT-based hospital logistics management system [12702-116]
12702 OE	Research on the transformation of unmanned automatic control production system in offshore oil and gas fields during typhoon [12702-103]
12702 OF	Design of encrypted OFDM system based on DFT-s-OFDM in FPGA [12702-38]
12702 0G	Design and development of equipment data management visualization system for intelligent KPI evaluation [12702-68]
12702 0H	Simulation of the QDPSK modulation and demodulation system based on Quartus II [12702-50]

12702 01	Environment design and construction of real-time dispatching and intelligent decision making simulation system for integrated coal supply chain of large energy group [12702-85]
12702 OJ	Design and implementation of SiPESC platform construction process dynamic simulation system [12702-16]
12702 OK	Model-based design and verification of functional architecture of civil aircraft pressure control system [12702-20]
12702 OL	Construction of refined operation management system of power users' points for mobile internet applications $[12702-74]$
12702 OM	Research on teaching quality evaluation system based on data mining technology [12702-99]
12702 ON	Design and implementation of a new equipment startup management system for power grid [12702-59]
12702 00	Application of distributed network in remote indoor temperature control and energy conservation system [12702-94]
12702 OP	Design and research of library space reservation system based on microservice architecture [12702-66]
12702 0Q	Flexible sensing-based knee joint flexion monitoring system [12702-37]
12702 OR	A non-contact intelligent temperature acquisition and monitoring system based on FPGA [12702-93]
12702 OS	Intelligent temperature control for continuous stirred tank reactor system based on reinforcement learning algorithm [12702-35]
12702 OT	Design of crop detection system based on Yolov5 and Internet of Things [12702-101]
12702 OU	Cooperative robust consensus for linear heterogeneous multi-agent systems under switching topologies [12702-9]
12702 0V	Design of power transmission and transformation engineering design review system based on spring struts hibernate framework [12702-17]
12702 OW	Fire and water mixed system frequency regulation based on fuzzy PID optimization research [12702-118]
12702 0X	Design of home burglar alarm system based on Bluetooth and GSM [12702-55]
	SATELLITE COMMUNICATION AND DIGITAL SIGNAL PROCESSING
12702 OY	Adaptive reclosing system for hybrid transmission lines consisting of power cables and overhead lines based on 5G communication [12702-71]

12702 OZ	Analysis and improvement of the influence of new measurement terminals EMC on high speed power line communication $[12702\text{-}28]$
12702 10	Research on multi-source data fusion method in power public service platform construction [12702-119]
12702 11	Electrostatic MEMS micromirror servo control for micro laser communication terminal [12702-80]
12702 12	Performance analysis of BDS-3 pseudo-range single point positioning model under environment of woods [12702-12]
12702 13	Intelligent push method of agricultural talents teaching resources based on association rule [12702-115]
12702 14	Characteristics and enlightenment of foreign satellite sea transportation [12702-79]
12702 15	Design of application system for vehicle recognition in community parking scenes in smart transportation [12702-77]
12702 16	Energy balance algorithm for heterogeneous wireless sensors based on bilevel decision-making and data distribution [12702-65]
12702 17	Development of 3D model import function based on ASSIMP and QT [12702-69]
12702 18	A CatBoost-based data driven method for equipment effectiveness assessment and prediction [12702-113]
12702 19	Multi-level association rule mining for wireless network time series data [12702-25]
12702 1A	Intelligent recognition system of converter station operation text based on computer image acquisition [12702-73]
12702 1B	Intelligent design of micro circuit breaker with electrical-energy measurement and self-diagnosis [12702-86]
12702 1C	Consistency assessment for vehicle validation based on multiple hierarchical projection GRA method [12702-54]
12702 1D	Tabu search based on variable neighborhood and its application to multi-depot vehicle routing problem [12702-31]
12702 1E	Research on CBR-based intelligent decision-making method for final heat treatment process of new energy heavy truck gear [12702-48]
12702 1F	Design of heterogeneous network security device management platform based on multi-source data [12702-88]
12702 1G	Spatial enhancement of chaotic optical communication keys based on multi-zone semiconductor lasers [12702-97]

12702 1H	Research on computer network security management based on big data [12702-98]
12702 11	Design of a secure storage platform for communication data in Hadoop [12702-53]
12702 1J	Research on discrepancy discrimination and auxiliary decision making of electric power standard terms [12702-8]
12702 1K	The multi-node efficient anti-interference communication method based on CCSDS protocol for Mars proximity space communication network [12702-75]
12702 1L	Diffractive deformed axicon to generate terahertz diffraction-free beam [12702-14]
12702 1M	Prediction and control of wheel squeal [12702-67]
12702 1N	An effective network traffic anomaly detection method based on deep learning for low-orbit satellite [12702-18]
12702 10	A trial combing a mirror array-based RIS with a liquid crystal-based RIS in indoor visible light communications [12702-21]
12702 1P	Mathematical model and analysis of LED lighting module in passenger room of high-speed rail vehicle [12702-7]
12702 1Q	Performance analysis for RIS-assisted communication systems under Weibull fading [12702-60]
12702 1R	Cloud-edge collaboration mechanism for low-voltage power distribution grid service operation [12702-5]
12702 1S	Experimental study on the influence rule of noncentral mass factor of straight crack rotating shaft [12702-41]
12702 1T	Multivariate time-series anomaly detection [12702-40]
12702 1U	Business differentiation-aware intelligent converged communication orchestration technology for distribution network [12702-26]
12702 1V	Multi-source power address data fusion based on data mining technology [12702-64]
12702 1W	Research on combat information link of aircraft group mixed formation [12702-57]
12702 1X	Intelligent identification of external damage factors around transmission lines based on satellite remote sensing images [12702-44]
	COMPUTER NETWORK AND PROGRAM DEVELOPMENT AND DESIGN
12702 1Y	Development of intelligent management system for health combat readiness materials based on RFID technology [12702-107]

12702 1Z	The construction of an intelligent water environment automatic monitoring system based on the Internet of Things [12702-29]
12702 20	Design and implementation of intelligent A/D module based on CPCI bus [12702-81]
12702 21	Blind spectrum sensing algorithm based on cyclic spectrum and deep learning [12702-23]
12702 22	Design and implementation of agricultural product traceability platform based on blockchain technology [12702-109]
12702 23	A low delay dynamic distributed TDMA slot allocation algorithm for ad hoc networks [12702-10]
12702 24	Authentication storage scheme based on trusted embedded devices [12702-63]
12702 25	Latent space knowledge representation enhancement for low resource machine translation [12702-46]
12702 26	Cluster routing algorithm based on agglomerative hierarchical clustering in wireless sensor networks [12702-6]
12702 27	Correcting ghost in single-shot spatiotemporal encoding by deep learning [12702-30]
12702 28	The design of a W-band transmitter with 2W output power [12702-42]
12702 29	Hybrid beamforming design for massive MIMO system: a deep learning approach [12702-62]
12702 2A	An adaptive dynamic service flow control strategy based on trTCM algorithm [12702-95]
12702 2B	Microservice cluster load balancing method based on improved least active number algorithm [12702-22]
12702 2C	A genetic algorithm-based research on drone trajectory planning strategy of cooperative inspection of transmission lines, substations and distribution lines [12702-92]
12702 2D	Link state-based routing optimization method for low orbit constellation networks [12702-78]
12702 2E	Construction of electric emergency materials storage system based on BP neural network [12702-39]
12702 2F	Joint optimization of latency, energy and reliability in fog computing [12702-49]
12702 2G	The application and implementation of wireless campus network in university comprehensive management [12702-2]
12702 2H	Research on the application of DSVPN integrating IPSec VPN security scheme in distance piano teaching $[12702\text{-}36]$
12702 21	Research on three-dimensional container loading problem based on combinatorial heuristic algorithm [12702-72]

12702 2J	Research and exploration of SLAM solutions based on mobile robots [12702-120]
12702 2K	Road-constrained trajectory recovery via BERT-based multi-task learning [12702-34]
12702 2L	Design of universal modulating-demodulating module for shipborne data transmission radio [12702-11]
12702 2M	Research on CMMI-oriented software project development quality management method [12702-96]
12702 2N	Coherent accumulation range defuzzification algorithm based on pseudo-code inter-pulse phase modulation [12702-90]
12702 20	IoT devices firmware security detection based on static analysis technology [12702-82]
12702 2P	A network deception defense mechanism based on virtual topology generation [12702-13]
12702 2Q	Differential adaptive SA-DEPSO algorithm based on particle swarm [12702-24]
12702 2R	Design of the scheme of clock jitter cache for circuit emulation service over packet [12702-19]
12702 2\$	CSNMG: constructing sequence neighbourhood mapping graphs to compress FASTQ files [12702-89]
12702 2T	Learning separate objects in clutter with deep reinforcement learning [12702-102]
12702 2U	Optimization of power grid structure based on meta-reinforcement learning [12702-15]
12702 2V	Field gas supply station monitoring based on software-defined PLC edge server [12702-61]
12702 2W	Distribution network fault location and isolation based on edge computing and 5G [12702-51]
12702 2X	5G interface management and resource allocation for massive access in electric hybrid-service scenario [12702-87]