

PROCEEDINGS OF SPIE

International Conference on Intelligent Traffic Systems and Smart City (ITSSC 2021)

Gouping Tan
Fengxin Cen
Editors

19–21 November 2021
Zhengzhou, China

Organized by
Hohai University (China)
Global Scientific Research Association (China)

Sponsored and Published by
SPIE

Volume 12165

Proceedings of SPIE 0277-786X, V. 12165

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 Intelligent Traffic Systems and Smart City (ITSSC 2021)*, edited by Guoping Tan, Fengxin Cen, Proc. of SPIE 12165, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510652064

ISBN: 9781510652071 (electronic)

Published by

SPIE

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

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2022 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

INTELLIGENT TRANSPORTATION TECHNOLOGY AND LOGISTICS TRANSPORTATION

- 12165 02 **A vehicle drive-based lane-change control strategy under the Internet of Vehicles environment [12165-19]**
- 12165 03 **Investigation and evaluation of rail transit and bus transfer facilities [12165-49]**
- 12165 04 **An automated vehicle control strategy including different information flow topologies for mixed platoon [12165-47]**
- 12165 05 **Research on automatic visualization technology of bridge disease information based on BIM [12165-62]**
- 12165 06 **Methods and practice of traffic simulation evaluation for traffic construction projects [12165-6]**
- 12165 07 **Linear programming research on material transportation and manpower of all provinces to assist Wuhan during the COVID-19 pandemic [12165-57]**
- 12165 08 **Establishment of intersection traffic flow prediction model based on random characteristics of cloud model [12165-2]**
- 12165 09 **Calculation for information quantity about highway traffic facilities in China [12165-24]**
- 12165 0A **BIM and IoT integration applied in airport infrastructure construction [12165-31]**
- 12165 0B **Multi-objective optimal charging scheduling strategy for electric vehicles considering traffic flow, power grid, and charging stations [12165-64]**
- 12165 0C **Multi-data source trajectory post-fusion based on sliding clustering in the Internet of Vehicles [12165-38]**
- 12165 0D **Research on the travel characteristics of online carpooling and subway multimodal transit based on big data [12165-74]**
- 12165 0E **Optimal estimation flux difference effect in the two-lane traffic flow lattice model [12165-51]**
- 12165 0F **Research on capacity of combined left-turn and U-turn lanes at intersections [12165-61]**
- 12165 0G **Research on the influencing factors of accident severity based on the optimization of density clustering algorithm [12165-30]**
- 12165 0H **Urban rail transit route choice model using mobile phone user's trajectory data [12165-23]**

- 12165 0I True 3D stereo display technology of digital railway location system [12165-69]
- 12165 0J Research on the decision-making model of multi-stage standby site selection for railway dangerous goods transportation under the condition of uncertain demand [12165-20]
- 12165 0K Research on accessibility measurement model of collection and distribution system for port based on generalized cost impedance function [12165-63]
- 12165 0L Accessibility analysis of National Highway 213 in Mao County based on GF-6 data [12165-68]
- 12165 0M Optimization of signalized intersection based on VISSIM-SSAM simulation [12165-28]
- 12165 0N Key technologies of low-carbon-oriented intelligent travel service for urban rail transit based on MaaS [12165-79]
- 12165 0O Trajectory planning method for automated vehicles based on risk prediction in mixed traffic environment [12165-4]
- 12165 0P Research on recognition method of vehicle automatic lane change behavior [12165-77]
- 12165 0Q Analysis of the factors affecting the death in traffic accident based on logistic model [12165-52]
- 12165 0R Research on arc erosion damage characteristics of carbon material in rail traffic engineering [12165-82]
- 12165 0S On-ramp dynamic control in passenger drop-off area at large intermodal transportation terminals [12165-3]
- 12165 0T Study on coordinated control of urban regional traffic system based on copula function [12165-26]
- 12165 0U Research on comprehensive evaluation system and methodology of urban low carbon transportation [12165-91]

SMART DIGITAL CITY AND MOBILE COMMUNICATION TECHNOLOGY

- 12165 0V Smart city: road traffic evaluation based on traffic flow model [12165-44]
- 12165 0W Hadoop-based spatio-temporal analysis of urban public transportation big data [12165-21]
- 12165 0X Optimal design of information system for the image of urban study room based on cloud computing [12165-72]
- 12165 0Y Fpc: feature map pruning using channel attention mechanism [12165-12]
- 12165 0Z A network migrating framework based on CloudSim [12165-45]

- 12165 10 **Development and application of digital holographic technology of network cloud platform in media production** [12165-87]
- 12165 11 **Self-attention technology in image segmentation** [12165-84]
- 12165 12 **Computing task offloading based on multi-hop V2V optimization algorithm research** [12165-37]
- 12165 13 **Digital twin modeling of data center computer room based on LSTM** [12165-9]
- 12165 14 **An efficient data acquisition method for a typical cybersecurity test cloud platform** [12165-48]
- 12165 15 **An incremental flow-based task scheduler for simulation tasks in cloud environments** [12165-18]
- 12165 16 **Implementation and debugging method of high performance mcu verification system based on arm development studio** [12165-7]
- 12165 17 **Research on the framework of culture dissemination system based on three-tier architecture** [12165-70]
- 12165 18 **A-MoMAC: mobility-aware and adaptive vehicular MAC protocol in VANETs** [12165-58]
- 12165 19 **Optimal dispatching of urban electro-thermal coupling system considering user comfort** [12165-8]
- 12165 1A **Changes of EEG signals in vehicle-pedestrian conflicting events with front collision warning on side-parking road** [12165-66]
- 12165 1B **A combined denoising algorithm for roadside LiDAR point clouds under snowy condition** [12165-73]
- 12165 1C **Analysis of the spatio-temporal characteristics of intercity travel based on SVD and complex network: take Bohai Rim City Group as an example** [12165-39]
- 12165 1D **Loss evaluation of urban integrated electricity-gas system under coordinated attacks** [12165-56]
- 12165 1E **A Kalman filtering algorithm to improve CACC data accuracy in V2X environment** [12165-10]
- 12165 1F **Research on the effectiveness of government governance in the context of smart cities** [12165-5]
- 12165 1G **Research on intelligent operation and maintenance technology of urban rail transit based on cloud computing platform** [12165-85]
- 12165 1H **A traffic signal smoothing and fast transition algorithm considering constraint adjacent period variation** [12165-55]
- 12165 1I **Survey of expressway infrastructure based on vehicle-borne mobile mapping system** [12165-54]

- 12165 1J **Resilience improvement method of urban electricity-gas integrated energy system under extreme event [12165-15]**
- 12165 1K **Analysis of intercity highway traffic trip based on spatial autocorrelation model: an empirical study using mobile signaling data [12165-60]**
- 12165 1L **Freeway traffic flow prediction based on hidden Markov model [12165-13]**
- 12165 1M **A stage pressure-based adaptive traffic signal control using reinforcement learning [12165-35]**
- 12165 1N **A HIL platform for evaluating OBU performance in C-V2X scenarios [12165-17]**
- 12165 1O **Development and application of city information modeling technology in urban construction [12165-90]**

ARTIFICIAL INTELLIGENCE TECHNOLOGY AND SMART WEARABLE DEVICES

- 12165 1P **Research on rapid construction technology of human machine interface based on component paper [12165-36]**
- 12165 1Q **Application of EEG in wearable brain-computer interfaces [12165-1]**
- 12165 1R **Improvements of ECG design for portable monitors based on classic 3-amplifier model [12165-95]**
- 12165 1S **Weather image classification based on generative adversarial network and transfer learning [12165-50]**
- 12165 1T **Research progress of deep learning in ECG [12165-94]**
- 12165 1U **Research on early warning of public opinion based on Internet of Things and text emotion analysis [12165-22]**
- 12165 1V **Simulation analysis of indoor orbital inspection robot based on Gazebo [12165-93]**
- 12165 1W **Micro hand gesture recognition system using hybrid dilated convolution [12165-32]**
- 12165 1X **A learning task scheduling for dispersed computing [12165-89]**
- 12165 1Y **The development of wearable ECG device [12165-92]**
- 12165 1Z **Research on the traceable intelligent garbage classification system based on voice interaction [12165-46]**
- 12165 20 **Driving risk field modeling and the influencing factors analysis for intelligent connected vehicle [12165-81]**

- 12165 21 **Intelligent coordinated control system of ramp and variable speed limit based on MPC** [12165-83]
- 12165 22 **Transformer fault diagnosis model based on FI-CNN method** [12165-80]
- 12165 23 **Selection and installation design of battery box for pure electric bus** [12165-75]
- 12165 24 **Study on temperature sensitivity of piezoelectric-based road energy collector** [12165-14]
- 12165 25 **Individual trip mode recognition based on smartphone GPS positioning data** [12165-34]
- 12165 26 **Adaptive task offloading in V2X networks based on deep reinforcement learning** [12165-16]
- 12165 27 **Design of a semi-linkage automatic control mechanism for manual transmission** [12165-53]
- 12165 28 **Multi-hop connectivity analysis and RSU deployment in urban vehicular networks** [12165-25]
- 12165 29 **Research on rapid response method of urban rail transit equipment failure disposal** [12165-33]
- 12165 2A **Research on the demand response bus optimization and its semidynamic approximation solution** [12165-11]
- 12165 2B **Mechanical analysis of input shaft of electric vehicle** [12165-67]
- 12165 2C **Intelligent traffic detection with millimeter-wave radar and camera** [12165-29]
- 12165 2D **Transformer fault diagnosis method based on IFCM-DNN adjudication network** [12165-59]