

PROCEEDINGS OF SPIE

***International Conference on
Intelligent and Human-Computer
Interaction Technology
(IHCIT 2022)***

Wei Wei
Editor

22–24 July 2022
Zhuhai, China

Organized by
Sun Yat-Sen University (China)

Sponsored by
AEIC Academic Exchange Information Centre (China)

Published by
SPIE

Volume 12344

Proceedings of SPIE 0277-786X, V. 12344

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

International Conference on Intelligent and Human-Computer Interaction Technology (IHCIT 2022),
edited by Wei Wei, Proc. of SPIE Vol. 12344, 1234401 · © 2022 SPIE
0277-786X · doi: 10.1117/12.2659811

Proc. of SPIE Vol. 12344 1234401-1

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 *International Conference on Intelligent and Human-Computer Interaction Technology (IHCIT 2022)*, edited by Wei Wei, Proc. of SPIE 12344, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X
ISSN: 1996-756X (electronic)

ISBN: 9781510657601
ISBN: 9781510657618 (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
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

vii *Conference Committee*

RESEARCH ON INTELLIGENT MECHANICAL EQUIPMENT AND QUALITY CONTROL TECHNOLOGY

- 12344 02 **Research and analysis on driving state of electric wheelchair on bumpy road [12344-6]**
- 12344 03 **Progress of DBS devices in treating Essential Tremor with self-adaptation function [12344-41]**
- 12344 04 **Research of the comparison for the cubic spline curve and the cubic Bezier curve in the cable path design of the launch vehicle [12344-64]**
- 12344 05 **Optimization of an armored vehicle seat space based on JACK [12344-36]**
- 12344 06 **The method and equipment design of household micro garbage disposal [12344-7]**
- 12344 07 **The study on anti-freezing of water and waste system for civil aircraft [12344-59]**
- 12344 08 **Hybrid control of force feedback and position feedback for bilateral teleoperation of underwater manipulator [12344-14]**
- 12344 09 **Research on the indicator system of new energy development level based on principal component analysis [12344-52]**
- 12344 0A **Research on age-appropriate design of mobile phone interface color based on Kansei engineering [12344-1]**
- 12344 0B **Research on data display based on mobile handheld instrument interface [12344-38]**
- 12344 0C **Layout optimization analysis of connecting rod forging production line based on resource balance analysis [12344-23]**
- 12344 0D **Studying permanent magnet synchronous motor sensorless control technology [12344-13]**
- 12344 0E **Design of ocean oil pollution collection device based on sea wave energy [12344-15]**
- 12344 0F **Research on the design of multifunctional nursing beds based on perceptual imagery [12344-20]**
- 12344 0G **Multivariate quality control of mobile phone case driven by principal component model [12344-4]**

- 12344 OH **Research on photoelectric detection gain control system based on FPGA** [12344-26]
- 12344 OI **Failure analysis of metal corrugated hose in space station** [12344-37]
- 12344 OJ **Noise immunity performance analysis based on MATLAB various amplitude modulation methods** [12344-40]
- 12344 OK **Evaluation index study of mobile phone walking navigation interface based on analytic hierarchy process** [12344-27]
- 12344 OL **Motion control and planning of a two-dimensional flying machine** [12344-11]
- 12344 OM **Discrete element modelling of Camellia oleifera fresh fruit and its simulation** [12344-5]
- 12344 ON **Lane line detection based on improved U-Net network** [12344-18]

APPLICATION OF INTELLIGENT ROBOT AND HUMAN-COMPUTER INTERACTION TECHNOLOGY

- 12344 OO **Human lower limb motion recognition method via surface electromyography** [12344-49]
- 12344 OP **Dynamics modeling and simulation analysis of 6-DOF intelligent cooperative robot** [12344-22]
- 12344 OQ **Design and power-assistance analysis of a bending-over exoskeleton robot** [12344-51]
- 12344 OR **Research on the fault diagnosis of an automatic magazine transport control system of a naval gun** [12344-29]
- 12344 OS **Design and research of multi-system-interaction robot in digital exhibition hall** [12344-69]
- 12344 OT **Semantic aggregation for accurate and efficient object detection** [12344-74]
- 12344 OU **The construction of intervention mode for people with depression based on human-computer interaction** [12344-30]
- 12344 OV **An investigation of the effect of human-computer interaction-based motor feedback on jump rope performance** [12344-39]
- 12344 OW **Augmented reality and brain-computer interfaces for human-robot collaboration in manufacturing contexts** [12344-44]
- 12344 OX **Visual rehabilitation strategies based on brain computer interface** [12344-42]
- 12344 OY **KNN vs. DNN: auto chatbot** [12344-72]
- 12344 OZ **Rehabilitation exercise based on brain-machine interaction with wearable robot** [12344-68]

- 12344 10 **The application of interactive concept in food packaging** [12344-2]
- 12344 11 **ROS-based architecture for robotic automatic mapping and intelligent obstacle avoidance using lidar and cameras** [12344-10]
- 12344 12 **Design and development of interactive virtual assembly system for spinning machine** [12344-24]
- 12344 13 **Research on smoke-free university construction management system based on cloud service** [12344-56]
- 12344 14 **Research on prediction model of second-hand house price** [12344-28]

ARTIFICIAL INTELLIGENCE ALGORITHM AND DATA SIGNAL PROCESSING ANALYSIS

- 12344 15 **Analysis of FIR filter and IIR filter for human speech signal different effects** [12344-48]
- 12344 16 **Omni-directional guide intelligent follow-up walker design** [12344-54]
- 12344 17 **Research on the application of cloud computing big data processing technology in smart grid construction** [12344-67]
- 12344 18 **TensorRT acceleration based on deep learning photoelectric target detection** [12344-21]
- 12344 19 **Multi-objective optimization design of assembly tolerance based on improved NSGA-II algorithm** [12344-66]
- 12344 1A **Research on the application of digital signal processing technology in gas detection** [12344-46]
- 12344 1B **Multi-UAV coordinated track planning method based on MSISOS algorithm** [12344-63]
- 12344 1C **The application of computer image processing in interface design** [12344-3]
- 12344 1D **Trajectory planning of sorting robot based on improved particle swarm optimization algorithm** [12344-9]
- 12344 1E **Performance analysis of 1/2 bit rate convolutional encoder** [12344-45]
- 12344 1F **Brushless DC motor speed control system employing fuzzy neural network PID base on the optimized whale algorithm** [12344-12]
- 12344 1G **Image interpolation** [12344-47]
- 12344 1H **Research on voiceprint identity recognition and verification technology and its application in mobile payment** [12344-71]

- 12344 1I **Research on salt dome recognition algorithm based on reverse attention mechanism**
[12344-25]
- 12344 1J **Thermal error prediction of machine tool spindle based on WOA-Elman network** [12344-53]
- 12344 1K **Knowledge base question answering based on regularization and feature fusion** [12344-33]
- 12344 1L **Design of intelligent Japanese teaching system based on web** [12344-60]

Conference Committee

Conference Chair

Daowen Qiu, Sun Yat-Sen University (China)

Publication Chair

Seifedine Kadry, Noroff University College (Norway)

Technical Program Committee Chair

Chuanjun Zhao, Shanxi University of Finance and Economics (China)

Technical Program Committees

Sandeep Saxena, Galgotias College of Engineering and Technology
Greater Noida (India)

Said Fathy EL-Zoghdy, Menoufia University (Egypt)

Jiang Zhu, Tokyo Institute of Technology (China)

Nirmalya Thakur, University of Cincinnati (United States)

Sahil Verma, Lovely Professional University (India)

Ziyan Zhang, Hainan Tropical Ocean University (China)

P. C. Srinivasa Rao, Koneru Lakshmaiah Education Foundation (India)

Md Mozasser Rahman CEng, Universiti Tun Hossein Onn
Malaysia (Bangladesh)

Saleh Mobayen, University of Tabriz (Iran)

Ariffin Nor Hapiza, Universiti Teknologi MARA (Malaysia)

Muhammad Aslam, Wuhan University (China)

Marina Yusoff, Institute of Infrastructure Engineering and Sustainable
Management Faculty of Computer and Mathematical Sciences
Universiti Teknologi MARA (Malaysia)

Aslina Baharum, Universiti Malaysia Sabah (Malaysia)

