

PROCEEDINGS OF SPIE

2020 International Conference on Image, Video Processing and Artificial Intelligence

Ruidan Su
Editor

21–23 August 2020
Shanghai, China

Organized by
Shanghai Advanced Research Institute, Chinese Academy of Sciences (China)

Published by
SPIE

Volume 11584

Proceedings of SPIE 0277-786X, V. 11584

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

2020 International Conference on Image, Video Processing and Artificial Intelligence,
edited by Ruidan Su, Dora Zhang, Proceedings of SPIE Vol. 11584, 1158401
© 2020 SPIE · CCC code: 0277-786X/20/\$21 · doi: 10.1117/12.2586375

Proc. of SPIE Vol. 11584 1158401-1

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 *2020 International Conference on Image, Video Processing and Artificial Intelligence*, edited by Ruidan Su, Proceedings of SPIE Vol. 11584 (SPIE, Bellingham, WA, 2020) Seven-digit Article CID Number.

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

ISBN: 9781510639973
ISBN: 9781510639980 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445

SPIE.org

Copyright © 2020, Society of Photo-Optical Instrumentation Engineers.

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 copying fees. The Transactional Reporting Service base fee for this volume is \$21.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online 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. The CCC fee code is 0277-786X/20/\$21.00.

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: *Proceedings of SPIE* follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article 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

IMAGE PROCESSING AND APPLICATIONS

- 11584 02 **Infrared detection and image simulation of high altitude balloon** [11584-3]
- 11584 03 **IterationNet: accelerating model incremental update for small datasets based on knowledge distillation** [11584-5]
- 11584 04 **A two-stage urine sediment detection method** [11584-12]
- 11584 05 **A generative adversarial network for fusion of infrared and visible images based on UNet++** [11584-15]
- 11584 06 **Multiscale deep fully convolutional network for sea-land segmentation of surveillance images** [11584-22]
- 11584 07 **Coastal zone image dehazing network based on feature fusion and adversarial training** [11584-23]
- 11584 08 **An automatic reading method for pointer meter based on one-stage detector** [11584-32]
- 11584 09 **Detection-free framework for cabinet switch state recognition** [11584-33]
- 11584 0A **R-MSSIM: image quality assessment while performing object detection** [11584-35]
- 11584 0B **Some efficient algorithms for morphological operations on hexagonal lattices and regular hexagonal domains** [11584-36]
- 11584 0C **Research on passenger flow statistics technology based on binocular stereo vision** [11584-41]
- 11584 0D **Optimal color selection for root-polynomial color correction** [11584-42]
- 11584 0E **Research on Beidou/GNSS wide area real-time positioning for automatic driving** [11584-45]
- 11584 0F **Research on perceptual fusion of audio and video based on deep learning** [11584-46]
- 11584 0G **Brief introduction of face image recognition method based on artificial intelligence** [11584-47]
- 11584 0H **A CGAN-based FOPEN target detection method for bi-frequency SAR** [11584-48]
- 11584 0I **Detecting GAN-synthesized faces based on deep alignment network** [11584-50]

- 11584 OJ **Multimodal medical image fusion based on saliency features detection in NSST domain**
[11584-54]
- 11584 OK **Research on 3D information perception system of highway pavement based on artificial intelligence** [11584-62]
- 11584 OL **Research on detection method of pavement diseases based on Unmanned Aerial Vehicle (UAV)** [11584-63]
- 11584 OM **Backwards pre-analysis and flexible quantization group size adjustment based quality optimization for screen content coding** [11584-64]
- 11584 ON **A novel tilting location and character segmentation algorithm for Chinese license plates**
[11584-66]
- 11584 OO **Eye in-painting using WGAN-GP for face images with mosaic** [11584-68]
- 11584 OP **Progressive network delivery approach of rendered image** [11584-69]
- 11584 OQ **LSH high dimension index algorithm based on thumbnails** [11584-72]
- 11584 OR **Image feature hierarchical index method for large image** [11584-73]
- 11584 OS **Improved KD tree high dimensional index algorithm based on location information** [11584-75]
- 11584 OT **Analysis of visible/infrared polarization characteristics of small UAV with complex background of buildings** [11584-77]
- 11584 OU **Image enhancement using convolutional neural network** [11584-80]
- 11584 OV **Highly parallel GPU accelerator for HEVC transform and quantization** [11584-81]
- 11584 OW **Bottom-up check and temporal rate proportion based fast InterIMV algorithm in versatile video coding** [11584-87]
- 11584 OX **A novel infrared image enhancement algorithm based on atmospheric transmission model**
[11584-96]

COMPUTER VISION AND AI

- 11584 OY **UGN: U-shape network based on graph convolution for 3D point cloud semantic segmentation**
[11584-6]
- 11584 OZ **Few-shot object detection with feature attention highlight module in remote sensing images**
[11584-9]
- 11584 10 **Urban waterlogging identification system based on public surveillance video** [11584-10]

- 11584 11 **Local structural feature description of point cloud by hierarchical projection** [11584-17]
- 11584 12 **Pose transfer based on generative adversarial networks** [11584-18]
- 11584 13 **Design of intelligent trash can be based on machine vision** [11584-26]
- 11584 14 **AI blended teaching in business English based on deep learning theory** [11584-29]
- 11584 15 **Based on CycleGAN infrared ship image expansion method** [11584-37]
- 11584 16 **Automated detection of lesion in computer tomography images based on Cascade R-CNN** [11584-43]
- 11584 17 **An improved human-object interaction detection method based on short-term memory selection network** [11584-52]
- 11584 18 **Fashion image analysis using single-stage detector** [11584-56]
- 11584 19 **Overview of deep convolutional neural network pruning** [11584-58]
- 11584 1A **Visual-inertial odometry based on point and line segments** [11584-71]
- 11584 1B **Learning 6D pose of textureless objects via multi-scale dense relation** [11584-78]
- 11584 1C **Improve EN model of simple cell combined with non-classical receptive field** [11584-79]
- 11584 1D **Human motion sequence recognition based on correlation feature selection and multilayer perceptron** [11584-82]
- 11584 1E **Dense feature pyramid network for ship detection in SAR images** [11584-90]
- 11584 1F **Robust communication strategy for federated learning by incorporating self-attention** [11584-94]

MACHINE LEARNING AND ARTIFICIAL NEURAL NETWORKS

- 11584 1G **Event detection without trigger words on movie scripts** [11584-13]
- 11584 1H **Bayesian network learning for winning structure and losing structure in basketball games** [11584-20]
- 11584 1I **Attention-based deep learning for network intrusion detection** [11584-27]
- 11584 1J **Automatic identification method of overpasses based on deep learning** [11584-28]

- 11584 1K **CNN-based feature cross and classifier for loan default prediction** [11584-34]
- 11584 1L **Application of machine learning algorithms for SCG signal classification** [11584-39]
- 11584 1M **Heart rate variability classification using deep learning with dimensional reduction** [11584-40]
- 11584 1N **Underdetermined blind separation of MIMO radar signals based on sparse reconstruction** [11584-44]
- 11584 1O **Coverage-driven deep prediction intervals method** [11584-51]
- 11584 1P **Federated learning with auxiliary generator** [11584-65]
- 11584 1Q **Geographic categories mapping based on ontology attribute characteristics learning** [11584-67]
- 11584 1R **Target-driven indoor visual navigation using inverse reinforcement learning** [11584-83]
- 11584 1S **Identification of dynamic functional connectivity pattern in resting state after acute mild traumatic brain injury** [11584-84]
- 11584 1T **Cross-grained context guided Chinese entity extraction with graph convolutional network** [11584-85]
- 11584 1U **Improving EEG-based motor imagery classification with conditional Wasserstein GAN** [11584-86]
- 11584 1V **Human action recognition in dynamic vision sensors using improved YOLOv3** [11584-89]
- 11584 1W **Terminal guidance law of small anti-ship missile based on DDPG** [11584-91]
- 11584 1X **Research on financial fraud identification of listed companies based on text data mining** [11584-92]
- 11584 1Y **An online capacity estimation method for LiFePO₄ battery module with incremental capacity curve processed by tracking differentiator under noises** [11584-95]
- 11584 1Z **Network security situation prediction with temporal deep learning** [11584-97]
- 11584 20 **A study of the effect of training sample size on a pre-trained model of CRNN EEG emotion recognition** [11584-100]
- 11584 21 **Establishment of carbon emission model of NC centerless grinding denture based on ERWC** [11584-101]

BIG DATA AND LARGE-SCALE SCIENTIFIC COMPUTING

- 11584 22 **A research on the establishment of automated driving scenario database using natural language processing method [11584-4]**
- 11584 23 **Channel pattern recognition based on wavelet clustering algorithm [11584-11]**
- 11584 24 **Association analysis method of drug-related cases based on Apriori and FP-growth algorithm [11584-24]**
- 11584 25 **Ant colony algorithm based on multiple state transition operators [11584-98]**
- 11584 26 **A copula-based Granger causality analysis method for root cause diagnosis of plant-wide oscillation [11584-99]**
- 11584 27 **Research on the privacy protection of electronic health records [11584-103]**

