

PROCEEDINGS OF SPIE

Fourth International Workshop on Pattern Recognition

Xudong Jiang
Zhenxiang Chen
Guojian Chen
Editors

28–30 June 2019
Nanjing, China

Organized by
School of Information Science and Engineering, Southeast University (China)

Sponsored by
Southeast University (China)

Published by
SPIE

Volume 11198

Proceedings of SPIE 0277-786X, V. 11198

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 *Fourth International Workshop on Pattern Recognition*, edited by Xudong Jiang, Zhenxiang Chen, Guojian Chen, Proceedings of SPIE Vol. 11198 (SPIE, Bellingham, WA, 2019) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510631137

ISBN: 9781510631144 (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 © 2019, 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/19/\$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

vii	Authors
ix	Conference Committee
xiii	Introduction

SESSION 1 IMAGE PROCESSING

11198 02	Effective region-based chroma subsampling method for Bayer CFA images [11198-25]
11198 03	Detection of imitation from authentic shoe apparel using integrated image processing techniques [11198-10]
11198 04	Recaptured image detection based on convolutional neural networks with local binary patterns coding [11198-26]
11198 05	A progressive approach for single image super-resolution [11198-29]
11198 06	MBNet: multi-scale bilinear convolutional neural networks for fine-grained visual classification towards real-time tasks [11198-5]
11198 07	Raw pork and beef quality determination through pH level and lipid oxidation patterns and image processing [11198-33]
11198 08	Improved threshold function image denoising method [11198-31]

SESSION 2 CLASSIFICATION AND CLUSTERING

11198 09	SE-dual path networks combined with a navigator for fine-grained classification [11198-30]
11198 0A	Research on Hadoop-based massive short text clustering algorithm [11198-9]
11198 0B	PoSAR image classification based on complex-valued convolutional neural network and Markov random field [11198-37]
11198 0C	Unsupervised classification of PoSAR image based on tensor product graph diffusion [11198-11]
11198 0D	Attention-based multi-scale transfer ResNet for skull fracture image classification [11198-27]

- 11198 0E Flight trajectory clustering based on a novel distance from a point to a segment set [11198-15]
- 11198 0F Caries lesion detection tool using near infrared image processing and decision tree learning [11198-34]
- 11198 0G Video-based detection and classification of driving postures by feature distance extraction and BP neural network [11198-23]
- 11198 0H A new method for constructing ensemble polynomial regression model in privacy preserving distributed environment [11198-19]

SESSION 3 PATTERN RECOGNITION AND DETECTION

- 11198 0I Facial expression recognition based on conjugate gradient extreme learning machine [11198-40]
- 11198 0J Heart beat classification and matching recognition based on hierarchical dynamic time warping [11198-28]
- 11198 0K Swine grunt analysis through intensity and frequency isolation with thermography using Adafruit AMG8833 IR thermal camera breakout for swine stress detection and reduction [11198-38]
- 11198 0L Multi-scale binary geometric feature description and matching for accurate registration of point clouds [11198-13]
- 11198 0M Extracting stroke errors from digital ink characters by beginning learners of Chinese as a foreign language based on accurate stroke matching [11198-6]
- 11198 0N Effective vision- and SoC-based fall detection for the elderly [11198-24]
- 11198 0O Scale-variant traffic sign detection [11198-22]
- 11198 0P An efficient approach combined with harmonic and shift invariance for piano music multi-pitch detection [11198-14]
- 11198 0Q Replay attack detection by channel frequency response difference enhancement [11198-39]
- 11198 0R Customization and optimization of SSD-based neural network model for detection of external force damage on transmission lines [11198-8]

SESSION 4 DATA ANALYSIS

- 11198 0S Retrospective convolution and static sample synthesis for instantaneous change detection [11198-43]
- 11198 0T Second-order convolutional network for crowd counting [11198-3]

- 11198 0U Research on the influence of node deployment in cluster for modeling efficiency [11198-41]
- 11198 0V Second glance framework (secG): enhanced ulcer detection with deep learning on a large wireless capsule endoscopy dataset [11198-20]
- 11198 0W Roaming of oblique photography model in unity3D [11198-16]
- 11198 0X Multi-parameter geometric measurement of piston based on laser projection [11198-7]
- 11198 0Y Radio frequency sensing based environmental monitoring technology [11198-44]
- 11198 0Z A design framework for adaptive e-learning environment [11198-42]
- 11198 10 Prediction accuracy analysis with logistic regression and CART decision tree [11198-2]
- 11198 11 An integrated deep-learning and geometric approach to 1D barcode [11198-4]
- 11198 12 Group binary weight networks [11198-32]
- 11198 13 Exploring data sampling techniques for imbalanced classification problems [11198-21]