

PROCEEDINGS OF SPIE

Twelfth International Conference on Graphics and Image Processing (ICGIP 2020)

Zhigeng Pan
Xinhong Hei
Editors

13–15 November 2020
Xi'an, China

Cosponsored by
Foshan University (China)
Chang'an University (China)
Northwest A&F University (China)
Sichuan University (China)
Ocean University of China (China)
University of Portsmouth (United Kingdom)
China Society of Image and Graphics (CSIG) (China)
China Graphics Society (CGS) (China)

Organized by
Xi'an University of Technology (China)

Published by
SPIE

Volume 11720

Proceedings of SPIE 0277-786X, V. 11720

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 *Twelfth International Conference on Graphics and Image Processing (ICGIP 2020)*, edited by Zhigeng Pan, Xinhong Hei, Proceedings of SPIE Vol. 11720 (SPIE, Bellingham, WA, 2021) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510642775

ISBN: 9781510642782 (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 © 2021, 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/21/\$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

TARGET DETECTION

- 11720 02 **False alarm sources detection based on LNIP and local probability distribution in infrared image** [11720-36]
- 11720 03 **Real-time people detection based on top-view TOF camera** [11720-21]
- 11720 04 **One-stage object detection with graph convolutional networks** [11720-76]
- 11720 05 **Validation of vehicle detection and distance measurement method using virtual vehicle approach** [11720-78]
- 11720 06 **RGB-skeleton fusion network for spatial-temporal action detection** [11720-12]
- 11720 07 **U-YOLO: higher precision YOLOv4** [11720-94]
- 11720 08 **Nighttime cattle detection based on YOLOv4** [11720-116]
- 11720 09 **An improved algorithm for ship detection in SAR images based on CNN** [11720-81]
- 11720 0A **Infrared small target detection in image sequences based on temporal low-rank and sparse decomposition** [11720-86]
- 11720 0B **Detection of multicomponent distribution by electrical impedance spectroscopic tomography** [11720-89]
- 11720 0C **Using spatio-temporal hybrid features for detecting bleeding point in laparoscopic surgery** [11720-10]
- 11720 0D **Application of region disparity in passenger flow statistics** [11720-123]
- 11720 0E **Ship detection in optical sensing images based on YOLOv5** [11720-61]

TARGET TRACKING

- 11720 0F **Simple online and real-time underwater multiple object tracking** [11720-20]
- 11720 0G **Multiple vehicles tracking in the aerial video based on fast incremental discriminative appearance learning** [11720-54]

- 11720 0H **Robust kernel correlation filter tracker based on adaptive scale and occlusion detection** [11720-41]
- 11720 0I **Multi-stage analysis for long-term tracking** [11720-58]
- 11720 0J **Visual object tracking based on Siamese network and online patch filters** [11720-109]
- 11720 0K **An improved anti-occlusion FDSST algorithm with SSDA** [11720-96]
- 11720 0L **Adaptive context-aware correlation filter tracker with multiple detection regions** [11720-84]

FEATURE EXTRACTION AND FUSION

- 11720 0M **Edge maps assisted image super-resolution using spatial feature transform** [11720-40]
- 11720 0N **A matching algorithm based on the topological structure of feature points** [11720-97]
- 11720 0O **Local descriptor generation based on SIFT reconstruction transformation in two directions** [11720-15]
- 11720 0P **Feature extraction of point cloud using 2D-3D transformation** [11720-98]
- 11720 0Q **ICP registration based on 3D point clouds feature descriptor** [11720-110]
- 11720 0R **Fusing local and global features for texture image retrieval** [11720-65]
- 11720 0S **Makeup transfer based on multi-scale feature loss** [11720-66]

IMAGE TRANSFORMATION AND ANALYSIS

- 11720 0T **Reconstructing HDR image of high color fidelity using Generative Adversarial Networks** [11720-53]
- 11720 0U **Progressive guidance dehazing network** [11720-108]
- 11720 0V **Low-budget real-time pose estimation method for personal physical exercise assistant** [11720-118]
- 11720 0W **Efficiently classify synthesized facial images generated by different synthesis methods** [11720-59]
- 11720 0X **A fast wedgelet partitioning for depth map prediction in 3D-HEVC** [11720-17]

11720 0Y **Efficient noise filtering method based on variational image decomposition for interferometric synthetic aperture radar phase images** [11720-77]

IMAGE SEGMENTATION

11720 0Z **Semantic segmentation of remote sensing images based on dual attention and multi-scale feature fusion** [11720-47]

11720 10 **Multi-feature fusion 3D-CNN for tooth segmentation** [11720-124]

11720 11 **Lung fields segmentation in chest radiographs using Dense-U-Net and fully connected CRF** [11720-51]

11720 12 **Automated geographic atrophy segmentation with multi-loss for SD-OCT images based on patient independent** [11720-38]

11720 13 **Panoptic segmentation of UAV images with deformable convolution network and mask scoring** [11720-9]

11720 14 **Semantic segmentation of road surface crack images using RU-Net model** [11720-95]

IMAGE ENHANCEMENT

11720 15 **Extreme low-light image enhancement using deep neural network** [11720-27]

11720 16 **Structure-based low-rank Retinex model for low-light image enhancement** [11720-72]

11720 17 **One-factor cancelable fingerprint template protection based on feature enhanced hashing** [11720-93]

11720 18 **Underwater single image enhancement based on latent low-rank decomposition and image fusion** [11720-28]

11720 19 **Backlit image enhancement based on foreground extraction** [11720-71]

11720 1A **Detection of palace site based on satellite infrared image enhancement** [11720-122]

11720 1B **Low-light image enhancement via layer decomposition and optimization** [11720-22]

11720 1C **VFEDet: a variational information bottleneck based feature enhancement object detection network** [11720-73]

IMAGE RECOGNITION AND APPLICATION

- 11720 1D **A method of combination word recognition based on word structure features** [11720-115]
- 11720 1E **CRNN with 2D attention for word recognition of English exams** [11720-30]
- 11720 1F **Classification and recognition method of fundus images based on SE-DenseNet** [11720-11]
- 11720 1G **Fine-grained recognition of Chinese food image based on DenseNet with attention mechanism** [11720-105]
- 11720 1H **Tennis posture classification and recognition based on an improved KNN** [11720-114]
- 11720 1I **Under-sampled face recognition via intra-class variant dictionary modelling** [11720-102]
- 11720 1J **Three-orientation joint features for multispectral palmprint recognition** [11720-64]
- 11720 1K **Application of comprehensive traffic flow monitoring in vehicle path planning system** [11720-16]
- 11720 1L **Research on recognition of dangerous driving behavior based on support vector machine** [11720-19]
- 11720 1M **Facial expression recognition based on multi-task learning with spatial feature disentanglement** [11720-24]

IMAGE PROCESSING TECHNOLOGY AND METHODS

- 11720 1N **Multi-resolution perception-optimized image compression based on JPEG2000 and visibility thresholds** [11720-6]
- 11720 1O **Ultrasound-based thyroid follicular neoplasm classification using fine-tuning and graph convolutional network** [11720-44]
- 11720 1P **Untargeted attack on targeted-label for multi-label image classification** [11720-101]
- 11720 1Q **Ranked dropout for handwritten digit recognition** [11720-60]
- 11720 1R **A strong background daytime star image processing method using improved morphology Top-Hat filter and pipeline filter** [11720-99]
- 11720 1S **Edge-preserving efficient dense stereo matching** [11720-26]
- 11720 1T **An improved dehazing algorithm using multi-scale weighted transmission fusion and self-adaptive gamma correction** [11720-14]

11720 1U **Imbalance satellite image colorization with semantic salience priors** [11720-63]

DIGITAL IMAGE ANALYSIS AND APPLICATION

11720 1V **Skin diseases classification method based on SE-Inception-v4 convolutional neural network** [11720-3]

11720 1W **A building extraction method via Gabor filter and multi-orientation π local binary pattern operator** [11720-18]

11720 1X **A control flow diagram generation algorithm based on clang static analyzer** [11720-49]

11720 1Y **Early recognition of convective initiation using 3D U-Net with multi-source data** [11720-50]

11720 1Z **Monocular depth estimation based on a single image: a literature review** [11720-119]

11720 20 **Radar image prediction using generative adversarial networks** [11720-46]

11720 21 **A novel face anti-spoofing method using multiple color space models** [11720-103]

11720 22 **Task allocation of multiple vehicles to attack targets by using particle swarm optimization algorithm** [11720-120]

COMPUTER VISION AND IMAGE PROCESSING

11720 23 **Influence analysis of Earth-atmosphere radiation on the imaging of space object** [11720-104]

11720 24 **Nonlocal mean method based on soft weighting for filling holes in the depth image based rendering system** [11720-25]

11720 25 **Semantic reconstruction based on RGB image and sparse depth** [11720-69]

11720 26 **Large-factor single image super-resolution based on back projection and residual block** [11720-32]

11720 27 **Music-driven lighting manipulation for stage performance visual design** [11720-74]

11720 28 **Grid cut and mix: flexible and efficient data augmentation** [11720-52]

11720 29 **Improvement of maintenance visibility analysis method based on the cone of human visual field** [11720-79]

11720 2A **Design and evaluation of virtual reality model based on eye movement analysis in street-crossing training of autistics** [11720-111]

MODERN INFORMATION THEORY AND INFORMATION PROCESSING

- 11720 2B **Mixed impulse and Gaussian noise removal using L0 sparse regularization** [11720-43]
- 11720 2C **UAV positioning algorithm based on LU decomposition preprocessing** [11720-68]
- 11720 2D **A novel method for inversing FeO content from spectral absorption characteristics and maturity index using LSCC data** [11720-2]
- 11720 2E **Select good regions for deblurring based on convolutional neural networks** [11720-37]
- 11720 2F **Spatial attention GAN for unsupervised clustering** [11720-23]
- 11720 2G **Iterative low-rank approximation based on the redundancy of each network layer** [11720-85]
- 11720 2H **Flow group convolution: group convolution with channels information interaction** [11720-42]
- 11720 2I **The effects of the Tencent Virtual Community on college students' motivation and engagement in online language classes** [11720-112]
- 11720 2J **AR-voice interaction research based on factor analysis** [11720-113]
- 11720 2K **Upper limb rehabilitation training system based on virtual reality** [11720-90]

COMPUTER AND ENGINEERING APPLICATION

- 11720 2L **Rolling path planning of mobile robot based on automatic diffidence ant algorithm** [11720-121]
- 11720 2M **Stage-by-stage knowledge distillation** [11720-4]
- 11720 2N **Real-time simulation of ship-ice collision based on physical property** [11720-117]
- 11720 2O **A review on assessment, early warning and auxiliary diagnosis of depression based on different modal data** [11720-75]
- 11720 2P **Disassembly modeling in ship maintenance with consideration of the influence of fasteners** [11720-83]
- 11720 2Q **Research on fuzzy comprehensive evaluation method of vessel equipment maintainability** [11720-80]