

PROCEEDINGS OF SPIE

Seventh International Conference on Computer Graphics and Virtuality (ICCGV 2024)

Jianjun Li

Editor

23–25 February 2024

Hangzhou, China

Sponsored by

Hangzhou Normal University (China)

Southwest Jiaotong University (China)

Published by

SPIE

Volume 13158

Proceedings of SPIE 0277-786X, V. 13158

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

Seventh International Conference on Computer Graphics and Virtuality (ICCGV 2024),
edited by Jianjun Li, Proc. of SPIE Vol. 13158, 1315801 · © 2024 SPIE
0277-786X · doi: 10.1117/12.3033697

Proc. of SPIE Vol. 13158 1315801-1

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 *Seventh International Conference on Computer Graphics and Virtuality (ICCGV 2024)*, edited by Jianjun Li, Proc. of SPIE 13158, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

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

ISBN: 9781510679771
ISBN: 9781510679788 (electronic)

Published by
SPIE
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time)
SPIE.org
Copyright © 2024 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

v *Conference Committee*

SESSION 1 DIGITAL IMAGING AND IMAGE RECONSTRUCTION

- 13158 01 **Self-supervised 3D face reconstruction based on dense key points** [13158-9]
- 13158 02 **Slice-based ray casting volume shadow of volumetric datasets** [13158-4]
- 13158 03 **A GPU computation-based ray tracing engine with user-friendly and scalable rendering features and structures** [13158-12]

SESSION 2 IMAGE PROCESSING AND METHODS

- 13158 04 **A lightweight stereo depth estimation network based on mobile devices** [13158-13]
- 13158 05 **Grand challenge of image processing in automatic detection of vehicles running in red lights** [13158-2]
- 13158 06 **Anomaly detection algorithm for asymmetric autoencoder based on knowledge distillation** [13158-20]

SESSION 3 MOTION TRACKING DETECTION AND ESTIMATION

- 13158 07 **A stereo vision-based real-time 3D hand pose estimation system combining nonlinear optimization** [13158-21]
- 13158 08 **A lightweight real-time 3D hand gesture tracking solution for mobile devices** [13158-19]
- 13158 09 **Human motion generation with StyleGAN** [13158-6]
- 13158 0A **Temporally consistent 3D human motion estimation from a video** [13158-16]
- 13158 0B **Joint misalignment-aware bilateral detection network for human pose estimation in videos** [13158-3]

SESSION 4 MEDICAL IMAGE SEGMENTATION AND COMPUTATIONAL MODELS

- 13158 0C **Colon polyp segmentation based on transformer and uncertainty guidance** [13158-11]
- 13158 0D **Uncertainty-generation-based diffusion probability model for brain tumor segmentation**
[13158-17]
- 13158 0E **A novel ensemble framework based on CNN models and Swin transformer for cervical
cytology image classification** [13158-5]
- 13158 0F **A denoising diffusion probabilistic model method for colorectal tissue unit pathological images
super-resolution** [13158-14]

Conference Committee

Conference Chairs

Ben Wang, Hangzhou Normal University (China)
Ce Zhu, University of Electronic Science and Technology of China
(China)
Haiquan Zhao, Southwest Jiaotong University (China)

Conference Advisory Chairs

Chuner Zhou, Hangzhou Normal University (China)
Deshuang Huang, Eastern Institute of Technology (China)

Conference Awards Chair

Xiumei Li, Hangzhou Normal University (China)

Organization Chairs

Zhenghong Qian, Hangzhou Normal University (China)
Zhengwei Yao, Hangzhou Normal University (China)

Conference Program Chairs

Bogong Su, William Paterson University (United States)
Ju Zhang, Hangzhou Normal University (China)
Jian Zhang, Hangzhou Normal University (China)
Shuifa Sun, Hangzhou Normal University (China)
Xingfa Shen, Hangzhou Dianzi University (China)
Mian Pan, Hangzhou Dianzi University (China)
Goi Bok Min, Universiti Tunku Abdul Rahman (Malaysia)
Jingen Ni, Soochow University (China)
Shiyuan Wang, Southwest University (China)
Xianhua Niu, Xihua University (China)
Kai Liu, Sichuan University (China)

Local Chairs

Yongwei Miao, Hangzhou Normal University (China)
Dandan Ding, Hangzhou Normal University (China)

Program Co-chairs

Yili Xia, Southeast University (China)
Jianhong Zhou, Xihua University (China)
Guobing Qian, Southwest University (China)

Local Organizing Committee

Yi Liu, Hangzhou Normal University (China)
Feifei Ding, Hangzhou Dianzi University (China)

Publication Chairs

Jianjun Li, Hangzhou Normal University (China)
Shanqing Zhang, Hangzhou Dianzi University (China)

Conference Technical Committee

Vijayan Asari, University of Dayton (United States)
Jiming Wu, California State University East Bay (United States)
Jan Egger, University Hospital Essen (Germany)
Tolga Capin, TED University (Turkey)
Pascal Lorenz, University of Haute Alsace (France)
Klimis Ntalianis, Technological Educational Institute of Athens
(Greece)
George Papagiannakis, University of Crete (Greece)
Xiaojun Chen, Shanghai Jiao Tong University (China)
Ching-Shoei Chiang, Soochow University (Taiwan)
Yew Kee Wong, Hong Kong Chu Hai College (Hong Kong, China)
Pavel Zemcik, Brno University of Technology (Czech Republic)
Ahmet Yücekaya, Kadir Has Üniversitesi (Turkey)
Changsoo Je, Sogang University (Korea, Republic of)
Loc Nguyen, Sunflower Soft Company (Vietnam)
Stefano Mattoccia, University of Bologna (Italy)
Nicolas Pronost, Université Claude Bernard Lyon 1 (France)
John Gibbs, University of Georgia (United States)
Robert S Laramee, University of Nottingham (United Kingdom)
Yang Cao, Nanjing Normal University (China)
Jian Lu, Dalian University (China)
Kangjian He, Yunnan University (China)
Hui Wang, Shijiazhuang Tiedao University (China)
Geetanjali Vinayak Kale, SCTR's Pune Institute of Computer
Technology (India)
Wanwan Li, University of South Florida (United States)
Soumyabrata Dev, University College Dublin (Ireland)
Jan Kubicek, Technical University of Ostrava (Czech Republic)
Yun Sheng, Liverpool John Moores University (United Kingdom)
Xueying Zeng, Ocean University of China (China)

Mengjie Huang, Xi'an Jiaotong-Liverpool University (China)
Gabriel Gomes de Oliveira, UNICAMP (Brazil)
Olarik Surinta, Mahasarakham University (Thailand)
Durgesh Samadhiya, National Chiao Tung University (Taiwan)
S. Balamurugan, Albert Einstein Engineering and Research Labs (India)
Haruna Abdu, Federal University Lokoja (Nigeria)
Diclehan Ulucan, University of Greifswald (Germany)

Session Chairs

Image recognition and detection technology
Pavel Loskot, ZJU-UIUC Institute, Zhejiang University (China)

Intelligent Image Analysis and Processing Methods
Guobing Qian, Southwest University (China)

