

Commenced Publication in 1973

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board

David Hutchison

Lancaster University, Lancaster, UK

Takeo Kanade

Carnegie Mellon University, Pittsburgh, PA, USA

Josef Kittler

University of Surrey, Guildford, UK

Jon M. Kleinberg

Cornell University, Ithaca, NY, USA

Friedemann Mattern

ETH Zurich, Zurich, Switzerland

John C. Mitchell

Stanford University, Stanford, CA, USA

Moni Naor

Weizmann Institute of Science, Rehovot, Israel

C. Pandu Rangan

Indian Institute of Technology, Madras, India

Bernhard Steffen

TU Dortmund University, Dortmund, Germany

Demetri Terzopoulos

University of California, Los Angeles, CA, USA

Doug Tygar

University of California, Berkeley, CA, USA

Gerhard Weikum

Max Planck Institute for Informatics, Saarbrücken, Germany

More information about this series at <http://www.springer.com/series/7412>

Shang-Hong Lai · Vincent Lepetit
Ko Nishino · Yoichi Sato (Eds.)

Computer Vision – ACCV 2016

13th Asian Conference on Computer Vision
Taipei, Taiwan, November 20–24, 2016
Revised Selected Papers, Part II

Editors

Shang-Hong Lai
National Tsing Hua University
Hsinchu
Taiwan

Vincent Lepetit
Graz University of Technology
Graz
Austria

Ko Nishino
Drexel University
Philadelphia, PA
USA

Yoichi Sato
The University of Tokyo
Tokyo
Japan

ISSN 0302-9743

ISSN 1611-3349 (electronic)

Lecture Notes in Computer Science

ISBN 978-3-319-54183-9

ISBN 978-3-319-54184-6 (eBook)

DOI 10.1007/978-3-319-54184-6

Library of Congress Control Number: 2017932642

LNCS Sublibrary: SL6 – Image Processing, Computer Vision, Pattern Recognition, and Graphics

© Springer International Publishing AG 2017

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Printed on acid-free paper

This Springer imprint is published by Springer Nature

The registered company is Springer International Publishing AG

The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

Welcome to the 2016 edition of the Asian Conference on Computer Vision in Taipei. ACCV 2016 received a total number of 590 submissions, of which 479 papers went through a review process after excluding papers rejected without review because of violation of the ACCV submission guidelines or being withdrawn before review. The papers were submitted from diverse regions with 69% from Asia, 19% from Europe, and 12% from North America.

The program chairs assembled a geographically diverse team of 39 area chairs who handled nine to 15 papers each. Area chairs were selected to provide a broad range of expertise, to balance junior and senior members, and to represent a variety of geographical locations. Area chairs recommended reviewers for papers, and each paper received at least three reviews from the 631 reviewers who participated in the process. Paper decisions were finalized at an area chair meeting held in Taipei during August 13–14, 2016. At this meeting, the area chairs worked in threes to reach collective decisions about acceptance, and in panels of nine or 12 to decide on the oral/poster distinction. The total number of papers accepted was 143 (an overall acceptance rate of 24%). Of these, 33 were selected for oral presentations and 110 were selected for poster presentations.

We wish to thank all members of the local arrangements team for helping us run the area chair meeting smoothly. We also wish to extend our immense gratitude to the area chairs and reviewers for their generous participation in the process. The conference would not have been possible without this huge voluntary investment of time and effort. We acknowledge particularly the contribution of 29 reviewers designated as “Outstanding Reviewers” who were nominated by the area chairs and program chairs for having provided a large number of helpful, high-quality reviews. Last but not the least, we would like to show our deepest gratitude to all of the emergency reviewers who kindly responded to our last-minute request and provided thorough reviews for papers with missing reviews. Finally, we wish all the attendees a highly simulating, informative, and enjoyable conference.

January 2017

Shang-Hong Lai
Vincent Lepetit
Ko Nishino
Yoichi Sato

Organization

ACCV 2016 Organizers

Steering Committee

Michael Brown	National University of Singapore, Singapore
Katsu Ikeuchi	University of Tokyo, Japan
In-So Kweon	KAIST, Korea
Tieniu Tan	Chinese Academy of Sciences, China
Yasushi Yagi	Osaka University, Japan

Honorary Chairs

Thomas Huang	University of Illinois at Urbana-Champaign, USA
Wen-Hsiang Tsai	National Chiao Tung University, Taiwan, ROC

General Chairs

Yi-Ping Hung	National Taiwan University, Taiwan, ROC
Ming-Hsuan Yang	University of California at Merced, USA
Hongbin Zha	Peking University, China

Program Chairs

Shang-Hong Lai	National Tsing Hua University, Taiwan, ROC
Vincent Lepetit	TU Graz, Austria
Ko Nishino	Drexel University, USA
Yoichi Sato	University of Tokyo, Japan

Publicity Chairs

Ming-Ming Cheng	Nankai University, China
Jen-Hui Chuang	National Chiao Tung University, Taiwan, ROC
Seon Joo Kim	Yonsei University, Korea

Local Arrangements Chairs

Yung-Yu Chuang	National Taiwan University, Taiwan, ROC
Yen-Yu Lin	Academia Sinica, Taiwan, ROC
Sheng-Wen Shih	National Chi Nan University, Taiwan, ROC
Yu-Chiang Frank Wang	Academia Sinica, Taiwan, ROC

Workshops Chairs

Chu-Song Chen	Academia Sinica, Taiwan, ROC
Jiwen Lu	Tsinghua University, China
Kai-Kuang Ma	Nanyang Technological University, Singapore

Tutorial Chairs

Bernard Ghanem	King Abdullah University of Science and Technology, Saudi Arabia
Fay Huang	National Ilan University, Taiwan, ROC
Yukiko Kenmochi	Université Paris-Est, France

Exhibition and Demo Chairs

Gee-Sern Hsu	National Taiwan University of Science and Technology, Taiwan, ROC
Xue Mei	Toyota Research Institute, USA

Publication Chairs

Chih-Yi Chiu	National Chiayi University, Taiwan, ROC
Jenn-Jier (James) Lien	National Cheng Kung University, Taiwan, ROC
Huei-Yung Lin	National Chung Cheng University, Taiwan, ROC

Industry Chairs

Winston Hsu	National Taiwan University, Taiwan, ROC
Fatih Porikli	Australian National University, Australia
Li Xu	SenseTime Group Limited, Hong Kong, SAR China

Finance Chairs

Yong-Sheng Chen	National Chiao Tung University, Taiwan, ROC
Ming-Sui Lee	National Taiwan University, Taiwan, ROC

Registration Chairs

Kuan-Wen Chen	National Chiao Tung University, Taiwan, ROC
Wen-Huang Cheng	Academia Sinica, Taiwan, ROC
Min Sun	National Tsing Hua University, Taiwan, ROC

Web Chairs

Hwann-Tzong Chen	National Tsing Hua University, Taiwan, ROC
Ju-Chun Ko	National Taipei University of Technology, Taiwan, ROC
Neng-Hao Yu	National Chengchi University, Taiwan, ROC

Area Chairs

Narendra Ahuja	UIUC
Michael Brown	National University of Singapore
Yung-Yu Chuang	National Taiwan University, Taiwan, ROC
Pau-Choo Chung	National Cheng Kung University, Taiwan, ROC
Larry Davis	University of Maryland, USA

Sanja Fidler	University of Toronto, Canada
Mario Fritz	Max Planck Institute for Informatics, Germany
Yasutaka Furukawa	Washington University in St. Louis, USA
Bohyung Han	Pohang University of Science and Technology, South Korea
Hiroshi Ishikawa	Waseda University, Japan
C.V. Jawahar	IIIT Hyderabad, India
Frédéric Jurie	University of Caen, France
Iasonas Kokkinos	CentraleSupélec/Inria, France
David Kriegman	UCSD
Ivan Laptev	Inria, France
Kyoung Mu Lee	Seoul National University
Jongwoo Lim	Hanyang University, South Korea
Liang Lin	Sun Yat-Sen University, China
Tyng-Luh Liu	Academia Sinica, Taiwan, ROC
Huchuan Lu	Dalian University of Technology, China
Yasuyuki Matsushita	Osaka University, Japan
Francesc Moreno-Noguer	Institut de Robòtica i Informàtica Industrial
Greg Mori	Simon Fraser University, Canada
Srinivasa Narasimhan	CMU
Shmuel Peleg	Hebrew University of Jerusalem, Israel
Fatih Porikli	Australian National University/CSIRO, Australia
Ian Reid	University of Adelaide, Australia
Mathieu Salzmann	EPFL, Switzerland
Imari Sato	National Institute of Informatics, Japan
Shin'ichi Satoh	National Institute of Informatics, Japan
Shiguang Shan	Chinese Academy of Sciences, China
Min Sun	National Tsing Hua University, Taiwan, ROC
Raquel Urtasun	University of Toronto, Canada
Anton van den Hengel	University of Adelaide, Australia
Xiaogang Wang	Chinese University of Hong Kong, SAR China
Hanzi Wang	Xiamen University
Yu-Chiang Frank Wang	Academia Sinica, Taiwan, ROC
Jie Yang	NSF
Lei Zhang	Hong Kong Poly University, SAR China

Contents – Part II

People and Actions

Sparse Code Filtering for Action Pattern Mining	3
<i>Wei Wang, Yan Yan, Liqiang Nie, Luming Zhang, Stefan Winkler, and Nicu Sebe</i>	
Learning Action Concept Trees and Semantic Alignment Networks from Image-Description Data	19
<i>Jiyang Gao and Ram Nevatia</i>	
Pedestrian Color Naming via Convolutional Neural Network	35
<i>Zhiyi Cheng, Xiaoxiao Li, and Chen Change Loy</i>	
Speed Invariance vs. Stability: Cross-Speed Gait Recognition Using Single-Support Gait Energy Image	52
<i>Chi Xu, Yasushi Makihara, Xiang Li, Yasushi Yagi, and Jianfeng Lu</i>	
Parametric Image Segmentation of Humans with Structural Shape Priors	68
<i>Alin-Ionut Popa and Cristian Sminchisescu</i>	

Faces

Lip Reading in the Wild	87
<i>Joon Son Chung and Andrew Zisserman</i>	
Recurrent Convolutional Face Alignment	104
<i>Wei Wang, Sergey Tulyakov, and Nicu Sebe</i>	
Continuous Supervised Descent Method for Facial Landmark Localisation . . .	121
<i>Marc Oliu, Ciprian Corneanu, László A. Jeni, Jeffrey F. Cohn, Takeo Kanade, and Sergio Escalera</i>	
Modeling Stylized Character Expressions via Deep Learning	136
<i>Deepali Aneja, Alex Colburn, Gary Faigin, Linda Shapiro, and Barbara Mones</i>	
Variational Gaussian Process Auto-Encoder for Ordinal Prediction of Facial Action Units.	154
<i>Stefanos Eleftheriadis, Ognjen Rudovic, Marc Peter Deisenroth, and Maja Pantic</i>	

Multi-Instance Dynamic Ordinal Random Fields for Weakly-Supervised Pain Intensity Estimation	171
<i>Adria Ruiz, Ognjen Rudovic, Xavier Binefa, and Maja Pantic</i>	

Deep Learning

Analysis on the Dropout Effect in Convolutional Neural Networks	189
<i>Sunghoon Park and Nojun Kwak</i>	
Efficient Model Averaging for Deep Neural Networks	205
<i>Michael Opitz, Horst Possegger, and Horst Bischof</i>	
Joint Training of Generic CNN-CRF Models with Stochastic Optimization. . .	221
<i>A. Kirillov, D. Schlesinger, S. Zheng, B. Savchynskyy, P.H.S. Torr, and C. Rother</i>	
Object-Aware Dictionary Learning with Deep Features	237
<i>Yurui Xie, Fatih Porikli, and Xuming He</i>	

People Tracking and Action Recognition

Gait Energy Response Function for Clothing-Invariant Gait Recognition	257
<i>Xiang Li, Yasushi Makihara, Chi Xu, Daigo Muramatsu, Yasushi Yagi, and Mingwu Ren</i>	
Action Recognition Based on Optimal Joint Selection and Discriminative Depth Descriptor.	273
<i>Haomiao Ni, Hong Liu, Xiangdong Wang, and Yueliang Qian</i>	
Model-Free Multiple Object Tracking with Shared Proposals	288
<i>Gao Zhu, Fatih Porikli, and Hongdong Li</i>	
Learning to Integrate Occlusion-Specific Detectors for Heavily Occluded Pedestrian Detection	305
<i>Chunluan Zhou and Junsong Yuan</i>	
Deep Second-Order Siamese Network for Pedestrian Re-identification	321
<i>Xuesong Deng, Bingpeng Ma, Hong Chang, Shiguang Shan, and Xilin Chen</i>	
Cost-Sensitive Two-Stage Depression Prediction Using Dynamic Visual Clues.	338
<i>Xingchen Ma, Di Huang, Yunhong Wang, and Yiding Wang</i>	
Human Interaction Recognition by Mining Discriminative Patches on Key Frames	352
<i>Dingyi Shan, Laiyun Qing, and Jun Miao</i>	

Stacked Overcomplete Independent Component Analysis for Action Recognition	368
<i>Zhikang Liu, Ye Tian, and Zilei Wang</i>	
Searching Action Proposals via Spatial Actionness Estimation and Temporal Path Inference and Tracking.	384
<i>Nannan Li, Dan Xu, Zhenqiang Ying, Zhihao Li, and Ge Li</i>	
Markov Chain Monte Carlo Cascade for Camera Network Calibration Based on Unconstrained Pedestrian Tracklets	400
<i>Louis Lettry, Ralf Dragon, and Luc Van Gool</i>	
Scale-Adaptive Deconvolutional Regression Network for Pedestrian Detection.	416
<i>Yousong Zhu, Jinqiao Wang, Chaoyang Zhao, Haiyun Guo, and Hanqing Lu</i>	
Author Index	431