

Commenced Publication in 1973

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board

David Hutchison

Lancaster University, UK

Takeo Kanade

Carnegie Mellon University, Pittsburgh, PA, USA

Josef Kittler

University of Surrey, Guildford, UK

Jon M. Kleinberg

Cornell University, Ithaca, NY, USA

Alfred Kobsa

University of California, Irvine, CA, USA

Friedemann Mattern

ETH Zurich, Switzerland

John C. Mitchell

Stanford University, CA, USA

Moni Naor

Weizmann Institute of Science, Rehovot, Israel

Oscar Nierstrasz

University of Bern, Switzerland

C. Pandu Rangan

Indian Institute of Technology, Madras, India

Bernhard Steffen

TU Dortmund University, Germany

Madhu Sudan

Microsoft Research, Cambridge, MA, USA

Demetri Terzopoulos

University of California, Los Angeles, CA, USA

Doug Tygar

University of California, Berkeley, CA, USA

Gerhard Weikum

Max Planck Institute for Informatics, Saarbruecken, Germany

Shi-Min Hu Ralph R. Martin (Eds.)

Computational Visual Media

First International Conference, CVM 2012
Beijing, China, November 8-10, 2012
Proceedings

Volume Editors

Shi-Min Hu

Tsinghua University, Department of Computer Science and Technology
Tsinghua Yuan, Beijing 100084, China
E-mail: shimin@tsinghua.edu.cn

Ralph R. Martin

Cardiff University, School of Computer Science and Informatics
5 The Parade, Roath, Cardiff CF24 3AA, UK
E-mail: ralph@cs.cf.ac.uk

ISSN 0302-9743

e-ISSN 1611-3349

ISBN 978-3-642-34262-2

e-ISBN 978-3-642-34263-9

DOI 10.1007/978-3-642-34263-9

Springer Heidelberg Dordrecht London New York

Library of Congress Control Number: 2012949182

CR Subject Classification (1998): I.4, I.5, I.2, H.3, I.2.10, H.4

LNCS Sublibrary: SL 6 – Image Processing, Computer Vision, Pattern Recognition, and Graphics

© Springer-Verlag Berlin Heidelberg 2012

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer. Violations are liable to prosecution under the German Copyright Law.

The use of general descriptive names, registered names, trademarks, 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.

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Preface

With the rapid development of multiple technologies, from the Internet to mobile phones and cameras, visual data are now widely available in huge amounts, and great variety, bringing significant opportunities for novel processing of visual information as well as for commercial applications.

The Computational Visual Media Conference 2012 (CVM 2012) was the first in a new conference series, providing a major international forum for exchanging novel research ideas and significant practical results both underpinning and applying visual media. The primary rationale for this new conference series is to bring together cross-disciplinary research which amalgamates aspects of computer graphics, computer vision, machine learning, image processing, video processing, visualization, and geometric computing. Original research topics in this area consider, *inter alia*, the classification, composition, retrieval, synthesis, and understanding of visual media.

Although CVM 2012 was a new conference, it attracted broad attention from researchers worldwide. A total of 81 submissions were made, of which 33 full papers were accepted. The conference took place during November 8–10, 2012, in Tsinghua University, Beijing, China, and was co-sponsored by ACM SIGGRAPH, the China Computer Federation and Tsinghua University.

We are grateful to all the authors, Program Committee members, and paper reviewers for their contributions, as well as to those individuals who helped to organize the conference.

Special thanks are given to the 973 Program of China (2011CB302200) and the National Natural Science Foundation of China (61120106007) for their support.

Shi-Min Hu
Ralph R. Martin

Organization

Honorary Conference Chair

Jia-Guang Sun	NSFC and Tsinghua University, China
---------------	-------------------------------------

Conference Chairs

Nadia Thalmann	University of Geneva, Switzerland
Hongbin Zha	Peking University, China

Program Co-chairs

Shi-Min Hu	Tsinghua University, China
Ralph Martin	Cardiff University, UK

Local Organizing Chair

Kun Xu	Tsinghua University, China
--------	----------------------------

Program Committee

Marc Alexa	Technische Universität Berlin, Germany
Hujun Bao	Zhejiang University, China
Bruno Lévy	LORIA/INRIA Lorraine, France
Jinxiang Chai	Texas A&M University, USA
Baoquan Chen	Shenzhen Institute of Advanced Technology, China
Robin Bing-Yu Chen	Taiwan University
Daniel Cohen-Or	Tel Aviv University, Israel
Thomas Ertl	University of Stuttgart, Germany
Sebti Foufou	University of Burgundy, France
Hongbo Fu	City University of Hong Kong
Xianfeng Gu	Stony Brook University, USA
Xiaohu Guo	University of Texas at Dallas, USA
Peter Hall	University of Bath, UK
Jiwu Huang	Sun Yat-sen University, China
Tao Ju	Washington University at St. Louis, USA
Leif Kobbelt	RWTH Aachen University, Germany
Myung-Soo Kim	Seoul National University, South Korea

VIII Organization

Young Kim	Ewha Womans University, South Korea
Yu-kun Lai	Cardiff University, UK
Seungyong Lee	Pohang University of Science and Technology, South Korea
Dani Lischinski	The Hebrew University Jerusalem, Israel
Yuncaï Liu	Shanghai Jiaotong University, China
Dinesh Manocha	University of N. Carolina, USA
Nelson Max	UC Davis, USA
Makoto Okabe	The University of Electro-Communications, Japan
Valerio Pascucci	University of Utah, USA
Holly Rushmeier	Yale University, USA
Hans Peter Seidel	Max Planck Institute for Computer Science, Germany
Ariel Shamir	Interdisciplinary Center of Israel
Hiromasa Suzuki	Tokyo University, Japan
Zhuowen Tu	University of California, Los Angeles, USA
Wang Rui	University of Massachusetts, USA
Wenping Wang	The University of Hong Kong
Tien-Tsin Wong	Chinese University of Hong Kong
Yizhou Yu	The University of Hong Kong; University of Illinois at Urbana-Champaign, USA
Jianmin Zheng	Nanyang Technological University, Singapore
Kun Zhou	Zhejiang University, China

Table of Contents

Section 1: Image Processing I

Identifying Shifted Double JPEG Compression Artifacts for Non-intrusive Digital Image Forensics	1
<i>Zhenhua Qu, Weiqi Luo, and Jiwu Huang</i>	
A Novel Customized Recompression Framework for Massive Internet Images	9
<i>Shouhong Ding, Feiyue Huang, Zhifeng Xie, Yongjian Wu, and Lizhuang Ma</i>	
Decomposition Equation of Basis Images with Consideration of Global Illumination	17
<i>Xueying Qin, Rui Zhang, Lili Lin, Fan Zhong, Guanyu Xing, and Qunsheng Peng</i>	
Intrinsic Image Decomposition with Local Smooth Assumption and Global Color Assumption	25
<i>Zhongqiang Wang and Li Zhu</i>	

Section 2: Image Processing II

A Game-Theoretical Approach to Image Segmentation	33
<i>Jing Li, Gang Zeng, Rui Gan, Hongbin Zha, and Long Wang</i>	
Clothed and Naked Human Shapes Estimation from a Single Image	43
<i>Yu Guo, Xiaowu Chen, Bin Zhou, and Qinpeng Zhao</i>	
Image Colorization with an Affective Word	51
<i>Xiaohui Wang, Jia Jia, Hanyu Liao, and Lianhong Cai</i>	
Semantic Image Clustering Using Object Relation Network	59
<i>Na Chen and Viktor K. Prasanna</i>	

Section 3: Geometry Processing

Efficient Solid Texture Synthesis Using Gradient Solids	67
<i>Guo-Xin Zhang, Yu-Kun Lai, and Shi-Min Hu</i>	
A Robust Algorithm for Denoising Meshes with High-Resolution Details	75
<i>Hanqi Fan, Qunsheng Peng, and Yizhou Yu</i>	

Mesh Segmentation for Parallel Decompression on GPU	83
<i>Jieyi Zhao, Min Tang, and Ruofeng Tong</i>	
Modeling Residential Urban Areas from Dense Aerial LiDAR Point Clouds	91
<i>Qian-Yi Zhou and Ulrich Neumann</i>	
Constrained Texture Mapping on Subdivision Surfaces	99
<i>Yanlin Weng, Dongping Li, and Yiyi Tong</i>	

Section 4: Saliency

Similar Region Contrast Based Salient Object Detection	107
<i>Qiang Fan and Chun Qi</i>	
A Shape Enhancement Technique Based on Multi-channel Saliency Measure	115
<i>Yongwei Miao, Jieqing Feng, Jinrong Wang, and Renato Pajarola</i>	
Multi-scale Salient Feature Extraction on Mesh Models	122
<i>Yong-Liang Yang and Chao-Hui Shen</i>	
Global Contrast of Superpixels Based Salient Region Detection	130
<i>Jie Wang, Caiming Zhang, Yuanfeng Zhou, Yu Wei, and Yi Liu</i>	

Section 5: Recognition, Perception and Learning

Incremental Shared Subspace Learning for Multi-label Classification	138
<i>Lei Zhang, Yao Zhao, and Zhenfeng Zhu</i>	
2D-Line-Drawing-Based 3D Object Recognition	146
<i>Yong-Jin Liu, Qiu-Fang Fu, Ye Liu, and Xiao-Lan Fu</i>	
Graph Regularized ICA for Over-Complete Feature Learning	154
<i>Yanhui Xiao, Zhenfeng Zhu, and Yao Zhao</i>	
Real-Time Recombination Method of Complex 3D Tree Model Information on Visual Perception Preserving	162
<i>Tianyang Dong, Yunyi Fan, Jing Fan, and Lei Ji</i>	

Section 6: Shape Analysis

Efficient Spherical Parametrization Using Progressive Optimization	170
<i>Shenghua Wan, Tengfei Ye, Maoqing Li, Hongchao Zhang, and Xin Li</i>	
Curve Skeleton Extraction by Graph Contraction	178
<i>Wei Jiang, Kai Xu, Zhi-Quan Cheng, Ralph R. Martin, and Gang Dang</i>	

Robust Feature Extraction Based on Principal Curvature Direction	186
<i>Jin-Jiang Li and Hui Fan</i>	
Compact Combinatorial Maps in 3D	194
<i>Xin Feng, Yuanzhen Wang, Yanlin Weng, and Yiyang Tong</i>	

Section 7: Media Retrieval

Towards Large Scale Cross-Media Retrieval via Modeling Heterogeneous Information and Exploring an Efficient Indexing Scheme	202
<i>Bo Lu, Guoren Wang, and Ye Yuan</i>	
Robust Place Recognition by Avoiding Confusing Features and Fast Geometric Re-ranking	210
<i>Mingying Gong, Lifeng Sun, Shiqiang Yang, and Yun Yang</i>	
Design and Implementation of a Context-Based Media Retrieval System	218
<i>Liang Zhao, Tangjian Deng, Hao Wang, Qingwei Liu, and Ling Feng</i>	
Determining Personality Traits from Renren Status Usage Behavior	226
<i>Shuotian Bai, Rui Gao, and Tingshao Zhu</i>	

Section 8: Capture, Rendering and Visualization

A Memory-Efficient KinectFusion Using Octree	234
<i>Ming Zeng, Fukai Zhao, Jiaxiang Zheng, and Xinguo Liu</i>	
Retracted: Vision-Based Measurement of Air Temperature Using Smoke as Medium	242
<i>Zhi-Xin Zhao, Wen-Shu Xiang, Hedetomo Sakaino, and Yun-Cai Liu</i>	
Intuitive Volume Eraser	250
<i>Enya Shen, Zhi-Quan Cheng, Jiazhi Xia, and Sikun Li</i>	
Accurate Depth-of-Field Rendering Using Adaptive Bilateral Depth Filtering	258
<i>Shang Wu, Kai Yu, Bin Sheng, Feiyue Huang, Feng Gao, and Lizhuang Ma</i>	

Erratum

Vision-Based Measurement of Air Temperature Using Smoke as Medium	E1
<i>Zhi-Xin Zhao, Wen-Shu Xiang, Hedetomo Sakaino, and Yun-Cai Liu</i>	

Author Index	267
------------------------	-----