Communications
in Computer and Information Science

Commenced Publication in 2007
Founding and Former Series Editors:
Phoebe Chen, Alfredo Cuzzocrea, Xiaoyong Du, Orhun Kara, Ting Liu,
Dominik Śliżak, and Xiaokang Yang

Editorial Board

Simone Diniz Junqueira Barbosa
                  Pontifical Catholic University of Rio de Janeiro (PUC-Rio),
                  Rio de Janeiro, Brazil

Joaquim Filipe
                  Polytechnic Institute of Setúbal, Setúbal, Portugal

Ashish Ghosh
                  Indian Statistical Institute, Kolkata, India

Igor Kotenko
                  St. Petersburg Institute for Informatics and Automation of the Russian
                  Academy of Sciences, St. Petersburg, Russia

Krishna M. Sivalingam
                  Indian Institute of Technology Madras, Chennai, India

Takashi Washio
                  Osaka University, Osaka, Japan

Junsong Yuan
                  University at Buffalo, The State University of New York, Buffalo, USA

Lizhu Zhou
                  Tsinghua University, Beijing, China
More information about this series at http://www.springer.com/series/7899
Preface

The present book includes extended and revised versions of a set of selected papers from the 12th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications (VISIGRAPP 2017), held in Porto, Portugal, from February 27 to March 1, 2017.

The purpose of the 12th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications (VISIGRAPP 2017) was to bring together researchers and practitioners interested in both theoretical advances and applications of computer vision, computer graphics, and information visualization. VISIGRAPP is composed of four co-located conferences, each specialized in at least one of the aforementioned main knowledge areas.

VISIGRAPP 2017 received 402 paper submissions from 48 countries, of which 4% are included in this book. The papers were selected by the event program co-chairs, based on a number of criteria that include the reviews and suggested comments provided by the Program Committee members, the session chairs’ assessments, and also the program chairs’ global view of all papers included in the technical program. The authors of selected papers were invited to submit a revised and extended version of their papers having at least 30% new material.

The papers selected to be included in this book contribute to the understanding of relevant trends of current research on Image and Video Formation, Preprocessing, Analysis and Understanding; Motion, Tracking and Stereo Vision; Computer Graphics and Rendering; Data Visualization and Interactive Visual Data Analysis; Agent-Based Human–Robot Interactions; and User Experience. The richness and the variety of theoretical advances and research results highlighted by these selected papers reflect the vitality and the prevalence of the research areas covered by the VISIGRAPP conference.

We would like to thank all the authors for their contributions to this book and also to the reviewers who helped ensure the quality of this publication.

February 2019

Ana Cláudio
Dominique Bechmann
Paul Richard
Takehiko Yamaguchi
Lars Linsen
Alexandru Telea
Francisco Imai
Alain Tremeau
Organization

Conference Chair
Jose Braz  Escola Superior de Tecnologia de Setúbal, Portugal

Program Co-chairs

GRAPP
Ana Cláudio  BioISI, Universidade de Lisboa, Portugal
Dominique Bechmann  CNRS-Université de Strasbourg, France

HUCAPP
Paul Richard  University of Angers, France
Takehiko Yamaguchi  Tokyo University of Science, Japan

IVAPP
Lars Linsen  Westfälische Wilhelms-Universität Münster, Germany
Alexandru Telea  University of Groningen, The Netherlands

VISAPP
Francisco Imai  Apple Inc., USA
Alain Tremeau  Université Jean Monnet in Saint Etienne, France

GRAPP Program Committee
Francisco Abad  Universidad Politécnica de Valencia, Spain
Marco Agus  King Abdullah University of Science and Technology, Saudi Arabia
Helder Araújo  University of Coimbra, Portugal
Lilian Aveneau  University of Poitiers, France
Francesco Banterle  Visual Computing Lab, Italy
Thomas Bashford-Rogers  The University of the West of England, UK
Dominique Bechmann  CNRS-Université de Strasbourg, France
Bedrich Benes  Purdue University, USA
Gonzalo Besuiievsky  Universitat de Girona, Spain
Carla Binucci  Università degli Studi di Perugia, Italy
Venceslas Biri  University Paris Est, France
Fernando Birra  UNL, Portugal
Jiri Bittner  Czech Technical University in Prague, Czech Republic
Kristopher Blom  Virtual Human Technologies, Czech Republic
Manfred Bogen Fraunhofer IAIS, Germany
Carles Bosch Eurecat, Spain
Stephen Brooks Dalhousie University, Canada
Cédric Buche LabSticc-CERV, France
Pedro Cano University of Granada, Spain
Maria Beatriz Carmo BioISI, Universidade de Lisboa, Portugal
L. G. Casado University of Almeria, Spain
Eva Cerezo University of Zaragoza, Spain
Teresa Chambel Lasige, University of Lisbon, Portugal
Antoni Chica Universitat Politecnica de Catalunya, Spain
Hwan-gue Cho Pusan National University, Korea, Republic of
Miguel Chover Universitat Jaume I, Spain
Ana Cláudio BioISI, Universidade de Lisboa, Portugal
Sabine Coquillart Inria, France
António Costa ISEP, Portugal
Rémi Cozot IRISA, France
Carsten Dachsbacher Karlsruhe Institute of Technology, Germany
Luiz Henrique de Figueiredo Institute of Computational Math. and Math. Geophysics, Siberian Branch of Russian Academy of Sciences, Russian Federation
Bailin Deng Cardiff University, UK
Fabian Di Fiore Hasselt University, Belgium
Paulo Dias Universidade de Aveiro, Portugal
John Dingliana Trinity College Dublin, Ireland
Jean-Michel Dischler Université de Strasbourg, France
Thierry Duval IMT Atlantique, France
Elmar Eisemann Delft University of Technology, The Netherlands
Marius Erdt Fraunhofer IDM@NTU, Singapore
Petros Faloutsos York University, Canada
Jean-Philippe Farrugia LIRIS Lab, France
Pierre-Alain Fayolle University of Aizu, Japan
Francisco R. Feito University of Jaén, Spain
Jie-Qing Feng Zhejiang University, China
Carla Freitas Universidade Federal do Rio Grande do Sul, Brazil
Davide Gadia Università degli Studi di Milano, Italy
Arturo Garcia University of Salford, UK
Alejandro García-Alonso University of the Basque Country, Spain
Miguel Gea University of Granada, Spain
Djamchid Ghazanfarpour University of Limoges, France
Enrico Gobbetti CRS4, Italy
Stephane Gobron HES-SO/Arc, Switzerland
Alexandrino Gonçalves Polytechnic Institute of Leiria, Portugal
Laurent Grisoni University of Lille Science and Technologies, France
James Hahn George Washington University, USA
Vlastimil Havran  
Czech Technical University in Prague, Czech Republic

Nancy Hitschfeld  
University of Chile, Chile

Ludovic Hoyet  
Inria Rennes - Centre Bretagne Atlantique, France

Andres Iglesias  
University of Cantabria, Spain

Insung Ihm  
Sogang University, Korea, Republic of

Gaetano Impoco  
Independent Researcher, Italy

Jean-Pierre Jessel  
IRIT, Paul Sabatier University, Toulouse, France

Juan Jiménez Delgado  
Universidad de Jaen, Spain

Xiaogang Jin  
Zhejiang University, China

Chris Joslin  
Carleton University, Canada

Cláudio Jung  
Universidade Federal do Rio Grande do Sul, Brazil

Josef Kohout  
University of West Bohemia, Czech Republic

Torsten Kuhlen  
RWTH Aachen University, Germany

Won-sook Lee  
University of Ottawa, Canada

Miguel Leitão  
ISEP, Portugal

Frederick Li  
University of Durham, UK

Ligang Liu  
University of Science and Technology of China, China

Marco Livesu  
Italian National Research Council (CNR), Italy

Hélio Lopes  
PUC-Rio, Brazil

Pedro Lopes  
ISCTE-IUL, Portugal

Jorge Lopez-Moreno  
Universidad Rey Juan Carlos, Spain

Joaquim Madeira  
University of Aveiro, Portugal

Luís Magalhães  
University of Minho, Portugal

Stephen Mann  
University of Waterloo, Canada

Michael Manzke  
Trinity College Dublin, Ireland

Adérito Marcos  
Universidade Aberta (Portuguese Open University), Portugal

Ricardo Marroquim  
Rio de Janeiro Federal University, Brazil

Belen Masia  
Universidad de Zaragoza, Spain

Oliver Mattausch  
Siemens, Switzerland

Nelson Max  
University of California, USA

Daniel Meneveaux  
University of Poitiers, France

Stéphane Méridou  
University of Limoges, France

Eder Miguel  
Universidad Rey Juan Carlos, Spain

Ramon Molla  
Universitat Politècnica de València, Spain

David Mould  
Carleton University, Canada

Adolfo Muñoz  
Universidad de Zaragoza, Spain

Lidia M. Ortega  
University of Jaén, Spain

Georgios Papaioannou  
Athens University of Economics and Business, Greece

Alexander Pasko  
Bournemouth University, UK

Giuseppe Patanè  
Italian National Research Council (CNR), Italy

Daniel Patel  
University of Bergen, Norway

Mathias Paulin  
IRIT - Université de Toulouse, France

João Pereira  
INESC-ID at IST, Portugal

João Pereira  
Instituto Superior de Engenharia do Porto, Portugal
Sinésio Pesco

Christopher Peters

Ruggero Pintus

Denis Pitzalis

Paulo Pomboinho

Anna Puig

Inmaculada Remolar

Mickael Ribardièrè

María Rivara

Nuno Rodrigues

Inmaculada Rodriguez

Przemyslaw Rokita

Luís Romero

Isaac Rudomin

Wang Rui

Holly Rushmeier

Luís Santos

Basile Sauvage

Mateu Sbert

Rafael J. Segura

A. Augusto Sousa

Jie Tang

Matthias Teschner

Daniel Thalmann

Rafael Torchelsen

Juan Carlos Torres

Alain Tremeau

Hassan Ugail

Torsten Ullrich

Anna Ursyn

Cesare Valenti

Luiz Velho

Andreas Weber

Daniel Weiskopf

Burkhard Wuensche

Lihua You

Jian Zhang

GRAPP Additional Reviewers

Silvia Biasotti

Daniela Giorgi

Imanol Muñoz-Pandiella

Félix Paulano-Godino

CNR - IMATI, Italy

National Research Council of Italy, Italy

Universitat de Girona, Spain

University of Jaén, Spain
HUCAPP Program Committee

Andrea Abate University of Salerno, Italy
Dominique Bechmann CNRS-Université de Strasbourg, France
Yacine Bellik LIMSI-CNRS, Orsay, France
Frank Biocca New Jersey Institute of Technology, USA
Karlheinz Blankenbach Pforzheim University, Germany
Gunnar Bolmsjö University West, Sweden
Mohamed Bouri EPFL, Switzerland
Gerd Bruder University of Central Florida, USA
Antonio Camurri University of Genoa, Italy
Daniel Cermak-sassenrath IT University of Copenhagen, Denmark
Jessie Chen U.S. Army Research Laboratory, USA
Yang-Wai Chow University of Wollongong, Australia
Sharon Chu Texas A&M University, USA
José Coelho University of Lisbon, Portugal
Cesar Collazos Universidad del Cauca, Colombia
André Constantino da Silva Instituto Federal de São Paulo, Brazil
Lynne Coventry Northumbria University, UK
Alma Culén University of Oslo, Norway
Damon Daylamani-Zad University of Greenwich, UK
Lucio Tommaso De Paolis University of Salento, Italy
Nancy Diniz Rensellaer Polytechnic Institute, USA
Larbi Esmahi Athabasca University, Canada
Tom Garner University of Portsmouth, UK
Cristina Gena Università di Torino, Italy
Panagiotis Germanakos University of Cyprus, Cyprus
Andrina Granic University of Split, Croatia
Toni Granollers University of Lleida, Spain
Michael Hohl Anhalt University of Applied Sciences, Germany
Barry Hughes University of Auckland, New Zealand
Gareth Jones Dublin City University, Ireland
Christophe Jouffrais CNRS and P. Sabatier University, France
Koji Kashihara Tokushima University, Japan
Uttam Kokil Kennesaw State University, USA
Heidi Krömker Technische Universität Ilmenau, Germany
Fabrizio Lamberti Politecnico di Torino, Italy
Chien-Sing Lee Sunway University, Malaysia
Tsai-Yen Li National Chengchi University, Taiwan
Yangmin Li The Hong Kong Polytechnic University, Hong Kong, SAR China
Chin-Teng Lin National Chiao Tung University, Taiwan
Flamina Luccio Università Ca’ Foscari Venezia, Italy
Sergio Luján-Mora University of Alicante, Spain
Célia Martinie University of Toulouse 3, France
Joi Moore University of Missouri, USA
<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andreas Nearchou</td>
<td>University of Patras, Greece</td>
</tr>
<tr>
<td>Keith Nesbitt</td>
<td>University of Newcastle, Australia</td>
</tr>
<tr>
<td>Radoslaw Niewiadomski</td>
<td>University of Genoa, Italy</td>
</tr>
<tr>
<td>Nuno Otero</td>
<td>Linnaeus University, Sweden</td>
</tr>
<tr>
<td>Evangelos Papadopoulos</td>
<td>NTUA, Greece</td>
</tr>
<tr>
<td>Ioannis Paraskevopoulos</td>
<td>University of Greenwich, UK</td>
</tr>
<tr>
<td>Gianluca Paravati</td>
<td>Polytechnic University of Turin, Italy</td>
</tr>
<tr>
<td>James Phillips</td>
<td>Auckland University of Technology, New Zealand</td>
</tr>
<tr>
<td>Armelle Prigent</td>
<td>L3i - University of La Rochelle, France</td>
</tr>
<tr>
<td>Rafael Radkowski</td>
<td>Iowa State University, USA</td>
</tr>
<tr>
<td>Paul Richard</td>
<td>University of Angers, France</td>
</tr>
<tr>
<td>Antonio Rinaldi</td>
<td>University of Naples Federico II, Italy</td>
</tr>
<tr>
<td>Covadonga Rodrigo</td>
<td>UNED, Spain</td>
</tr>
<tr>
<td>Ottniel Rodriguez</td>
<td>Universidad Autónoma del Estado de México, Mexico</td>
</tr>
<tr>
<td>Juha Röning</td>
<td>University of Oulu, Finland</td>
</tr>
<tr>
<td>Paul Rosenthal</td>
<td>Germany</td>
</tr>
<tr>
<td>José Rouillard</td>
<td>Université des Sciences et Technologies de Lille,</td>
</tr>
<tr>
<td></td>
<td>France</td>
</tr>
<tr>
<td>Sandra Sanchez-Gordon</td>
<td>Escuela Politecnica Nacional, Ecuador</td>
</tr>
<tr>
<td>Antonio-José Sánchez-Salmerón</td>
<td>Universitat Politecnica de Valencia, Spain</td>
</tr>
<tr>
<td>Andrea Sanna</td>
<td>Politecnico di Torino, Italy</td>
</tr>
<tr>
<td>Corina Sas</td>
<td>Lancaster University, UK</td>
</tr>
<tr>
<td>Trenton Schulz</td>
<td>Norwegian Computing Center, Norway</td>
</tr>
<tr>
<td>Berglind Smaradottir</td>
<td>University of Agder, Norway</td>
</tr>
<tr>
<td>Daniel Thalmann</td>
<td>Ecole Polytechnique Federale de Lausanne,</td>
</tr>
<tr>
<td></td>
<td>Switzerland</td>
</tr>
<tr>
<td>Godfried Toussaint</td>
<td>New York University Abu Dhabi, UAE</td>
</tr>
<tr>
<td>Pauliina Tuomi</td>
<td>Tampere University of Technology, Finland</td>
</tr>
<tr>
<td>Windsor Viana</td>
<td>Federal University of Ceará (UFC), Brazil</td>
</tr>
<tr>
<td>Kostas Vlachos</td>
<td>University of Ioannina, Greece</td>
</tr>
<tr>
<td>Ina Wechsung</td>
<td>Technische Universität Berlin, Germany</td>
</tr>
<tr>
<td>Yingcai Xiao</td>
<td>University of Akron, USA</td>
</tr>
<tr>
<td>Takehiko Yamaguchi</td>
<td>Tokyo University of Science, Japan</td>
</tr>
</tbody>
</table>

**IVAPP Program Committee**

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mark Anderson</td>
<td>Edge Hill University, UK</td>
</tr>
<tr>
<td>Vladan Babovic</td>
<td>National University of Singapore, Singapore</td>
</tr>
<tr>
<td>George Baciu</td>
<td>The Hong Kong Polytechnic University,</td>
</tr>
<tr>
<td></td>
<td>Hong Kong, SAR China</td>
</tr>
<tr>
<td>Till Bergmann</td>
<td>Max Planck Society, Germany</td>
</tr>
<tr>
<td>Jürgen Bernard</td>
<td>TU Darmstadt, Germany</td>
</tr>
<tr>
<td>Rita Borgo</td>
<td>King’s College London, UK</td>
</tr>
<tr>
<td>David Borland</td>
<td>University of North Carolina at Chapel Hill, USA</td>
</tr>
<tr>
<td>Massimo Brescia</td>
<td>Istituto Nazionale di AstroFisica, Italy</td>
</tr>
</tbody>
</table>
Ross Brown  
Queensland University of Technology,  
Brisbane, Australia

Maria Beatriz Carmo  
BioISI, Universidade de Lisboa, Portugal

Daniel Cernea  
University of Kaiserslautern, Germany

Stuart Charters  
Lincoln University, New Zealand

Guoning Chen  
University of Houston, USA

Lieu-Hen Chen  
National Chi Nan University, Taiwan

Yongwan Chun  
University of Texas at Dallas, USA

Joao Comba  
UFRGS, Brazil

Christoph Dalitz  
Niederrhein University of Applied Sciences, Germany

Robertas Damasevicius  
Kaunas University of Technology, Lithuania

Mihaela Dinsoreanu  
Technical University of Cluj-Napoca, Romania

Georgios Dounias  
University of the Aegean, Greece

Achim Ebert  
University of Kaiserslautern, Germany

Osman Elgawi  
Sultan Qaboos University, Oman

Ronak Etemadpour  
City College, CUNY, USA

Chi-Wing Fu  
The Chinese University of Hong Kong, Hong Kong, SAR China

Mohammad Ghoniem  
Luxembourg Institute of Science and Technology, Luxembourg

Randy Goebel  
University of Alberta, Canada

Denis Gracanin  
Virginia Tech, USA

Martin Graham  
University of Edinburgh, UK

Daniel Griffith  
University of Texas at Dallas, USA

Georges Grinstein  
University of Massachusetts Lowell, USA

Julian Heinrich  
University of Tübingen, Germany

Professor Holliman  
Newcastle University, UK

Torsten Hopp  
Karlsruhe Institute of Technology, Germany

Alfred Inselberg  
Tel Aviv University, Israel

Won-ki Jeong  
UNIST, Korea, Republic of

Mark Jones  
Swansea University, UK

Jessie Kennedy  
Edinburgh Napier University, UK

Andreas Kerren  
Linnaeus University, Sweden

Sehwan Kim  
WorldViz LLC, USA

Jörn Kohlhammer  
Fraunhofer Institute for Computer Graphics Research, Germany

David Koop  
UMass Dartmouth, USA

Martin Kraus  
Aalborg University, Denmark

Simone Kriglstein  
Vienna University of Technology, Austria

Phaedon Kyriakidis  
Cyprus University of Technology, Cyprus

Denis Lalanne  
University of Fribourg, Switzerland

Haim Levkowitz  
University of Massachusetts, Lowell, USA

Jie Liang  
Peking University, China

Innar Liiv  
Tallinn University of Technology/University of Oxford, Estonia

Chun-Cheng Lin  
National Chiao Tung University, Taiwan
Lars Linsen Westfälische Wilhelms-Universität Münster, Germany
Giuseppe Liotta University of Perugia, Italy
Zhicheng Liu Adobe Research, USA
Eamonn Maguire CERN, Switzerland
Krešimir Matkovic VRVis Research Center, Austria
Kazuo Misue University of Tsukuba, Japan
Torsten Moeller University of Vienna, Austria
Stephen North Infovisible, USA
Steffen Oeltze-Jafra Otto von Guericke University Magdeburg, Germany
Benoît Otjacques Luxembourg Institute of Science and Technology (LIST), Luxembourg
Philip Rhodes University of Mississippi, USA
Patrick Riehmann Bauhaus-Universität Weimar, Germany
Adrian Rusu Fairfield University, USA
Ignaz Rutter University of Passau, Germany
Beatriz Santos University of Aveiro, Portugal
Giuseppe Santucci University of Rome, Italy
Angel Sappa ESPOL Polytechnic University (Ecuador) and Computer Vision Center (Spain), Spain
Celmar Silva University of Campinas, Brazil
Juergen Symanzik Utah State University, USA
Yasufumi Takama Tokyo Metropolitan University, Japan
Roberto Theron Universidad de Salamanca, Spain
Hugo Valle Weber State University, USA
Huy Vo The City College of New York, USA
Günter Wallner University of Applied Arts Vienna, Austria
Tino Weinkauf KTH Royal Institute of Technology, Sweden
Daniel Weiskopf Universität Stuttgart, Germany
Jinrong Xie eBay Inc., USA
Kai Xu Middlesex University, UK
Anders Ynnerman Linköping University, Sweden
Hongfeng Yu University of Nebraska - Lincoln, USA
Xiaoru Yuan Peking University, China

IVAPP Additional Reviewers

Jie Hua University of Technology Sydney, Australia
Peng song University of Science and Technology of China, China
Pierre Vanhulst Université de Fribourg, Switzerland
Wei Zeng Singapore-ETH Centre, Singapore
Björn Zimmer Linnaeus University, Sweden
VISAPP Program Committee

Davide Moroni  Institute of Information Science and Technologies (ISTI)-CNR, Italy
Amr Abdel-Dayem  Laurentian University, Canada
Andrew Adamatzky  University of the West of England, UK
Ilya Afanasyev  Innopolis University, Russian Federation
Sos Agaian  College of Staten Island and the Graduate Center, CUNY, USA
Vicente Alarcon-Aquino  Universidad de las Americas Puebla, Mexico
Mokhled Al-Tarawneh  Mu’tah University, Jordan
Matthew Antone  Massachusetts Institute of Technology, USA
Djamila Aouada  University of Luxembourg, Luxembourg
Karm Arya  ABV-Indian Institute of Information Technology and Management, India
Angelos Barmpoutis  University of Florida, USA
Giuseppe Baruffa  University of Perugia, Italy
Mohamed Batouche  University Constantine 2, Algeria
Sebastiano Battiato  University of Catania, Italy
Ardhendu Behera  Edge Hill University, UK
Fabio Bellavia  Università degli Studi di Firenze, Italy
Olga Bellon  Universidade Federal do Paraná, Brazil
Achraf Ben-Hamadou  Digital Research Center of Sfax, Tunisia
Jenny Benoîs-Pineau  LABRI, University of Bordeaux, France
Robert Bergevin  Université Laval, Canada
Neil Bergmann  University of Queensland, Australia
Du Bo  Wuhan University, China
Adrian Bors  University of York, UK
Roland Bremond  Institut Français des Sciences et Technologies des Transports, de l’aménagement et des Réseaux (IFSTTAR), France
Marius Brezovan  University of Craiova, Romania
Valentin Brimkov  State University of New York, USA
Alfred Bruckstein  Technion, Israel
Arcangelo Bruna  STMicroelectronics, Italy
Ioan Buciu  Universitatea din Oradea, Romania
Xianbin Cao  Beihang University, China
Alice Caplier  GIPSA-lab, France
Franco Cardillo  Consiglio Nazionale delle Ricerche, Italy
M. Emre Celebi  University of Central Arkansas, USA
Satish Chand  Netaji Subhas Institute of Technology and Jawaharlal Nehru University Delhi, India
Chin-Chen Chang  Feng Chia University, Taiwan
Jocelyn Chanussot  Grenoble Institute of Technology Institut Polytechnique de Grenoble, France
Samuel Cheng  University of Oklahoma, USA
Michal Choras
University of Technology and Life Sciences Bydgoszcz and ITTI Poznan, Poland

Chien-Hsing Chou
Tamkang University, Taiwan

Carlo Colombo
Università degli Studi di Firenze, Italy

Donatello Conte
Université de Tours, France

Fabio Cuzzolin
Oxford Brookes University, UK

Larry Davis
University of Maryland College Park, USA

Kenneth Dawson-Howe
Trinity College Dublin, Ireland

Guido de Croon
Delft University of Technology, The Netherlands

Anselmo Cardoso de Paiva
Universidade Federal do Maranhao, Brazil

Thomas Deserno
Technische Universität Braunschweig, Germany

Michel Devy
LAAS-CNRS, France

Sotirios Diamantas
University of Nevada, Reno, USA

Yago Diez
Yamagata University, Japan

Jana Dittmann
Otto-von-Guericke-Universität Magdeburg, Germany

Aijuan Dong
Hood College, USA

Anastasios Drosou
Centre for Research and Technology, Hellas, Greece

Peter Eisert
Fraunhofer Institut für Nachrichtentechnik, Germany

Mahmoud El-Sakka
The University of Western Ontario, Canada

Grigori Evreinov
University of Tampere, Finland

Jean-Baptiste Fasquel
University of Angers, France

Jianqiao Feng
Google, USA

Aaron Fenster
Robarts Research Institute, Canada

Stefano Ferilli
University of Bari, Italy

Gernot Fink
TU Dortmund, Germany

Tyler Folsom
QUEST Integrated Inc., USA

Gian Foresti
University of Udine, Italy

Mohamed Fouad
Military Technical College, Egypt

Fabio Galasso
OSRAM GmbH, Germany

Antonios Gasteratos
Democritus University of Thrace, Greece

Claudio Gennaro
CNR, Italy

Herman Gomes
Universidade Federal de Campina Grande, Brazil

Juan A. Gómez-Pulido
University of Extremadura, Spain

Luiz Goncalves
Federal University of Rio Grande do Norte, Brazil

Amr Goni
The American University in Cairo, Egypt

Manuel González-Hidalgo
Balearic Islands University, Spain

Bernard Gosselin
University of Mons, Belgium

Nikos Grammalidis
Centre of Research and Technology Hellas, Greece

Costantino Grana
Università degli Studi di Modena e Reggio Emilia, Italy

Daniel Harari
Weizmann Institute of Science, Israel

Anthony Ho
University of Surrey, UK

Wladyslaw Homenda
Warsaw University of Technology, Poland

Hui-Yu Huang
National Formosa University, Taiwan

Céline Hudelot
Ecole Centrale de Paris, France

Chih-Cheng Hung
Kennesaw State University, USA

David i
Universitat Oberta de Barcelona, Spain
Iacopo Masi  University of Southern California, USA
Mitsuharu Matsumoto  The University of Electro-Communications, Japan
Jaime Melendez  Universitat Rovira i Virgili, Spain
Radko Mesiar  Slovak University of Technology, Slovak Republic
Leonid Mestetskiy  Lomonosov Moscow State University, Russian Federation
Cyrille Migniot  Université de Bourgogne - le2i, France
Max Mignotte  Université de Montreuil, Canada
Dan Mikami  NTT, Japan
Steven Mills  University of Otago, New Zealand
Nabin Mishra  Stoecker and Associates, USA
Pradit Mittrapiyanuruk  Srinakharinwirot University, Thailand
Birgit Moeller  Martin Luther University Halle-Wittenberg, Germany
Kostantinos Moustakas  University of Patras, Greece
Feiping Nie  University of Texas at Arlington, USA
Marcos Nieto  Vicomtech-ik4, Spain
Mikael Nilsson  Lund University, Sweden
Takahiro Okabe  Kyushu Institute of Technology, Japan
Yoshihiro Okada  Kyushu University, Japan
Gonzalo Pajares  Universidad Complutense de Madrid, Spain
William Puech  University of Montpellier II, France
Giovanni Puglisi  University of Cagliari, Italy
Xiaojun Qi  Utah State University, USA
Bogdan Raducanu  Computer Vision Center, Spain
Giuliana Ramella  CNR - Istituto per le Applicazioni del Calcolo M. Picone, Italy
Huamin Ren  Inmeta Consulting AS, Norway
Phill Rhee  Inha University, Korea, Republic of
Marcos Rodrigues  Sheffield Hallam University, UK
Ramón Ruiz  Universidad Politécnica de Cartagena, Spain
Silvio Sabatini  University of Genoa, Italy
Farhang Sahba  Sheridan Institute of Technology and Advanced Learning, Canada
Ovidio Salvetti  National Research Council of Italy - CNR, Italy
Andreja Samcovic  University of Belgrade, Serbia
Javier Sánchez  University of Las Palmas de Gran Canaria, Spain
K. C. Santosh  The University of South Dakota, USA
Jun Sato  Nagoya Institute of Technology, Japan
Shinichi Sato  National Institute of Informatics, Japan
Gerald Schaefer  Loughborough University, UK
Raimondo Schettini  University of Milano - Bicocca, Italy
Fiorella Sgallari  University of Bologna, Italy
Shishir Shah  University of Houston, USA
Caifeng Shan  Philips Research, The Netherlands
Lik-Kwan Shark  University of Central Lancashire, UK
Maryam Shokri  MaryMas Technologies LLC, USA
Luciano Silva
Universidade Federal do Parana, Brazil

Bogdan Smolka
Silesian University of Technology, Poland

Ferdous Sohel
Murdoch University, Australia

Ömer Soysal
Southeastern Louisiana University, USA

Filippo Stanco
Università di Catania, Italy

William Stoecker
Stoecker and Associates/Missouri University of Science and Technology, USA

Mu-Chun Su
National Central University, Taiwan

Chuan Sun
NYC Data Science Academy, USA

David Svoboda
Masaryk University, Czech Republic

Tamás Szirányi
MTA SZTAKI, Hungary

Ryszard Tadeusiewicz
AGH University of Science and Technology, Poland

Norio Tagawa
Tokyo Metropolitan University, Japan

Hiroki Takahashi
The University of Electro-Communications, Tokyo, Japan

Tolga Tasdizen
University of Utah, USA

João Tavares
Universidade do Porto, Portugal

Alexandru Telea
University of Groningen, The Netherlands

YingLi Tian
The City College of New York, USA

H. Tizhoosh
University of Waterloo, Canada

Yubing Tong
University of Pennsylvania, USA

Andrea Torsello
Università Ca’ Foscari di Venezia, Italy

Alain Tremeau
Université Jean Monnet in Saint Etienne, France

Yulia Trusova
Federal Research Center Computer Science and Control of the Russian Academy of Sciences, Russian Federation

Du-Ming Tsai
Yuan-Ze University, Taiwan

Cesare Valenti
Università degli Studi di Palermo, Italy

Joost van de Weijer
Autonomous University of Barcelona, Spain

Vassilios Vonikakis
Advanced Digital Sciences Center (ADSC), Singapore

Frank Wallhoff
Jade University of Applied Science, Germany

Tao Wang
BAE Systems, USA

Toyohide Watanabe
Nagoya Industrial Science Research Institute, Japan

Quan Wen
University of Electronic Science and Technology of China, China

Andrew Willis
University of North Carolina at Charlotte, USA

Christian Wöhler
TU Dortmund University, Germany

Stefan Wörz
University of Heidelberg, Germany

Yan Wu
Georgia Southern University, USA

Pingkun Yan
Rensselaer Polytechnic Institute, USA

Vera Yashina
Dorodnicyn Computing Center of the Russian Academy of Sciences, Russian Federation

Alper Yilmaz
Ohio State University, USA

Lara Younes
Inria, France

Hongfeng Yu
University of Nebraska - Lincoln, USA

Huiyu Zhou
Queen’s University Belfast, UK
Yun Zhu  
UCSD, USA

Li Zhuo  
Beijing University of Technology, China

Peter Zolliker  
Empa, Swiss Federal Laboratories for Materials Science and Technology, Switzerland

Ju Zou  
University of Western Sydney, Australia

**VISAPP Additional Reviewers**

Lorenzo Baraldi  
Università degli Studi di Modena e Reggio Emilia, Italy

Júlio Batista  
IMAGO Research Group, Brazil

ArielBayá  
CONICET, Argentina

Daniele Di Mauro  
University of Catania, Italy

Marco Fanfani  
University of Florence, Italy

Antonino Furnari  
University of Catania, Italy

Juan Carlos Galan  
Universidad de las Americas Puebla, Mexico

René Grzeszick  
TU Dortmund University, Germany

Attila Kiss  
MTA SZTAKI, Hungary

Marc Masana Castrillo  
Computer Vision Center, Spain

Filippo Milotta  
University of Catania, Italy

Alessandro Ortis  
University of Catania, Italy

Axel Plinge  
TU Dortmund, Germany

Leonard Rothacker  
TU Dortmund University, Germany

Suman Saha  
Oxford Brookes University, UK

Gurkirt Singh  
Oxford Brookes University, UK

Evangelos Vlachos  
University of Patras, Greece

Jun Wan  
CASIA, China

Wei Xiang  
University of Texas at Arlington, USA

Ruomei Yan  
Oxford Brookes University, UK

Lichao Zhang  
Computer Vision Center, Spain

**Invited Speakers**

Jack van Wijk  
Eindhoven University of Technology, The Netherlands

Holly Rushmeier  
Yale University, USA

Jean-Daniel Fekete  
Inria, France

Nadia Magnenat-Thalmann  
NTU, Singapore and MIRALab, University of Geneva, Switzerland
Contents

Computer Graphics Theory and Applications

Calibrating, Rendering and Evaluating the Head Mounted Light Field Display ................................................................. 3
Anne Juhler Hansen, Jákup Klein, and Martin Kraus

Human Computer Interaction Theory and Applications

More than Just Human: The Psychology of Social Robots .............. 31
Daniel Ullrich and Sarah Diefenbach

Kazumi Egawa and Muneo Kitajima

The Impact of Field of View on Robotic Telepresence Navigation Tasks .... 66
Federica Bazzano, Fabrizio Lamberti, Andrea Sanna, and Marco Gaspardone

Computer Vision Theory and Applications

One-Shot Learned Priors in Augmented Active Appearance Models for Anatomical Landmark Tracking ................................... 85
Oliver Mothes and Joachim Denzler

Line-Based SLAM Considering Prior Distribution of Distance and Angle of Line Features in an Urban Environment .............................. 105
Kei Uehara, Hideo Saito, and Kosuke Hara

Weak-Perspective and Scaled-Orthographic Structure from Motion with Missing Data .............................................................. 128
Levente Hajder

Spatiotemporal Optimization for Rolling Shutter Camera Pose Interpolation ............................................................................. 154
Philippe-Antoine Gohard, Bertrand Vandeportaele, and Michel Devy

Hierarchical Hardware/Software Algorithm for Multi-view Object Reconstruction by 3D Point Clouds Matching ................................. 176
Ferran Roure, Xavier Lladó, Joaquim Salvi, Tomislav Privanić, and Yago Diez
Real-Time HDTV-to-8K TV Hardware Upconverter ........................................ 192
  Seiichi Gohshi

Non-local Haze Propagation with an Iso-Depth Prior .................................. 213
  Incheol Kim and Min H. Kim

CUDA-Accelerated Feature-Based Egomotion Estimation .............................. 239
  Safa Ouerghi, Remi Boutteau, Xavier Savatier, and Fethi Tlili

Automatic Retinal Vascularity Identification and Artery/Vein Classification
Using Near-Infrared Reflectance Retinographies ........................................... 262
  Joaquim de Moura, Jorge Novo, Marcos Ortega, Noelia Barreira,
  and Pablo Charlón

Change Detection and Blob Tracking of Fish in Underwater Scenarios ............. 279
  Martin Radolko, Fahimeh Farhadifard, and Uwe von Lukas

Optimizing Phoneme-to-Viseme Mapping for Continuous
Lip-Reading in Spanish ......................................................... 305
  Adriana Fernandez-Lopez and Federico M. Sukno

A Context-Aware Method for View-Point Invariant
Long-Term Re-identification ....................................................... 329
  Athira Nambiar and Alexandre Bernardino

On Using 3D Support Geometries for Measuring Human-Made Corner
Structures with a Robotic Total Station ............................................. 352
  Christoph Klug, Dieter Schmalstieg, Thomas Gloor, and Clemens Arth

Author Index ................................................................. 375