CEIG 2017

XXVII Spanish Computer Graphics Conference

Editors

Fco. Javier Melero
and Nuria Pelechano

Organized by

Eurographics Association -
Spanish Chapter

XXVII Spanish Computer Graphics Conference

Sevilla, Spain

June 28 – 30, 2017

Conference Chair
Diego Gutiérrez, Universidad de Zaragoza

Program Chairs
Fco. Javier Melero, Universidad de Granada
Nuria Pelechano, Universidad Politécnica de Cataluña

Proceedings Production Editor
Dieter W. Fellner (TU Darmstadt & Fraunhofer IGD, Germany)

Sponsored by EUROGRAPHICS Association

DOI: 10.2312/ceig.20172016

delivered by EUROGRAPHICS DIGITAL LIBRARY
www.eg.org diglib.eg.org

This work is subject to copyright.

All rights reserved, whether the whole or part of the material is concerned, specifically those of translation, reprinting, re-use of illustrations, broadcasting, reproduction by photocopying machines or similar means, and storage in data banks.

Copyright ©2017 by the Eurographics Association
Postfach 2926, 38629 Goslar, Germany

Published by the Eurographics Association
–Postfach 2926, 38629 Goslar, Germany–
in cooperation with
Institute of Computer Graphics & Knowledge Visualization at Graz University of Technology
and
Fraunhofer IGD (Fraunhofer Institute for Computer Graphics Research), Darmstadt

ISBN 978-3-03868-046-8

The electronic version of the proceedings is available from the Eurographics Digital Library at `http://diglib.eg.org`

Table of Contents

Table of Contents iii

Preface v

Author Index vi

Geometry and Animation

An Improved Parallel Technique for Neighbour Search on CUDA 1
Juan J. Perea and Juan M. Cordero

Dissipation Potentials for Yarn-Level Cloth 11
Rosa M. Sánchez-Banderas and Miguel A. Otaduy

Object Recognition

Physically Based Skeleton Tracking 19
Axel López-Gandía and Antonio Susín

Extending Industrial Digital Twins with Optical Object Tracking 23
Antonio Tammaro, Álvaro Segura, Aitor Moreno, and Jairo R. Sánchez

Unsupervised Framework for People Counting Using a Stereo-based Camera 27
José Negrillo, Francisco R. Feito, Rafael J. Segura, Carlos Javier Ogayar, José Manuel Fuertes, and Manuel Lucena

Applications I

Google Tango Outdoors. Augmented Reality for Underground Infrastructures 31
Gregorio Soria, Lidia Ortega, and Francisco R. Feito

Volume Visualization

Direct Volume Rendering of Stack-Based Terrains 41
Alejandro Graciano, Antonio J. Rueda, and Francisco R. Feito

Downsampling and Storage of Pre-Computed Gradients for Volume Rendering 51
Jesús Díaz-García, Pere Brunet, Isabel Navazo, and Pere-Pau Vázquez

Applications II

3D GIS Based on WebGL for the Management of Underground Utilities 61
Juan Manuel Jurado, Lidia Ortega, and Francisco R. Feito

Fireman Rescue: A Serious Game for Fire Fighting Training 65
Alejandro Ríos, Carles Bonet, J. L. Morales, Axel Alavedra, Alejandro París, and Marc Guillén

Table of Contents

A Curvature-based Method for Identifying the Contact Zone Between Bone Fragments: First Steps 69
J. Roberto Jiménez-Pérez, Félix Paulano-Godino, and Juan J. Jiménez-Delgado

An Interactive Tool for Modeling Ancient Masonry Buildings 73
Josep Lluis Fita, Gonzalo Besuievsky, and Gustavo Patow

Non-photorealistic Rendering

Transfer Learning for Illustration Classification 77
Manuel Lagunas and Elena Garces

Fast Stippling based on Weighted Centroidal Voronoi Diagrams 87
Eila Gómez, Elías Méndez, Germán Arroyo, and Domingo Martín

Illumination

Improved Intuitive Appearance Editing based on Soft PCA 97
Sandra Malpica, Miguel Barrio, Diego Gutierrez, Ana Serrano, and Belen Masia

Transient Photon Beams 107
Julio Marco, Wojciech Jarosz, Diego Gutierrez, and Adrian Jarabo

Procedural Modeling

Procedural Semantic Cities 113
Otger Rogla, Nuria Pelechano, and Gustavo Patow

Tree Variations 121
Oscar Argudo, Carlos Andújar, and Antoni Chica

Procedural Generation of Natural Environments with Restrictions 131
Cristina Gasch, Miguel Chover, and Inmaculada Remolar

Preface

It is with deep satisfaction that we write this Foreword to the Proceedings of the XXVII Congreso Español de Informática Gráfica, CEIG (Eurographics Spanish Chapter Conference) held in Sevilla, June 28 - 30, 2017.

CEIG continues a tradition of bringing together researchers, academics and professionals from all Spanish universities and research institutions, all of them experts in computer graphics.

We have received a total of 34 submissions, 12 of them have been accepted as full paper and 7 of them as short paper. Moreover, 4 posters will be presented in a fast forward session. We would like to thank the authors their effort in submitting so high-quality papers, providing the latest advances in the computer graphics community in Spain. Furthermore, we acknowledge the programme committee members their valuable reviews, that have helped authors to improve the quality of their results, and proposed a set of interesting improvements for those papers that have been rejected. We know very well how valuable is a top scientist's minute, so thank you very much for your time, dear reviewers.

In addition to the contributed papers, three invited keynote presentations are included in the programme. The opening keynote will be by Dr. Carol O'Sullivan, of Trinity College of Dublin, who will speak about "The perception of physical interactions in Mixed Reality". On Thursday, Dr. Anna Vilanova of TU Delft will talk about "Visual Analysis using Dimensionality Reduction". Finally, the closing keynote will be given by Marcos Fajardo, recently awarded by the Academy of Motion Picture Arts & Sciences for the creative vision and original implementation of the Arnold Renderer.

The local organizing committee, leaded by Juan Manuel Cordero, has prepared a very compact programme. Despite of the expected hot weather in Sevilla during the conference days, they have prepared a wonderful nightly visit to Sevilla on Wednesday, and a fantastic gala dinner on Thursday. These networking slots are undoubtedly the origin of future relationships and common projects.

Javier Melero and Nuria Pelechano
CEIG2017 Programme Chairs

Author Index

Alavedra, Axel 65
Andújar, Carlos 121
Argudo, Oscar 121
Arroyo, Germán 87
Barrio, Miguel 97
Besuievsky, Gonzalo 73
Bonet, Carles 65
Brunet, Pere 51
Chica, Antoni 121
Chover, Miguel 131
Cordero, Juan M. 1
Díaz-García, Jesús 51
Feito, Francisco R. 27, 31, 41, 61
Fita, Josep Lluis 73
Fuertes, José Manuel 27
Garces, Elena 77
Gasch, Cristina 131
Gómez, Eila 87
Graciano, Alejandro 41
Guillén, Marc 65
Gutierrez, Diego 97, 107
Jarabo, Adrian 107
Jarosz, Wojciech 107
Jiménez-Delgado, Juan J. 69
Jiménez-Pérez, J. Roberto 69
Jurado, Juan Manuel 61
Lagunas, Manuel 77
López-Gandía, Axel 19
Lucena, Manuel 27
Malpica, Sandra 97
Marco, Julio 107
Martín, Domingo 87
Masia, Belen 97
Méndez, Elías 87
Morales, J. L. 65
Moreno, Aitor 23
Navazo, Isabel 51
Negrillo, José 27
Ogayar, Carlos Javier 27
Ortega, Lidia 31, 61
Otaduy, Miguel A. 11
París, Alejandro 65
Patow, Gustavo 73, 113
Paulano-Godino, Félix 69
Pelechano, Nuria 113
Perea, Juan J. 1
Remolar, Inmaculada 131
Ríos, Alejandro 65
Rogla, Otger 113
Rueda, Antonio J. 41
Sánchez, Jairo R. 23
Sánchez-Banderas, Rosa M. 11
Segura, Álvaro 23
Segura, Rafael J. 27
Serrano, Ana 97
Soria, Gregorio 31
Susín, Antonio 19
Tammaro, Antonio 23
Vázquez, Pere-Pau 51