

Computer Graphics & Visual Computing (CGVC) 2019

Eurographics UK Chapter Proceedings

Bangor University, United Kingdom

12 – 13 September 2019

Conference Chair

Franck P. Vidal, Bangor University

Programme Co-Chairs

Gary K. L. Tam, Swansea University
Jonathan C. Roberts, Bangor University

Local Organisers

Panagiotis D. Ritsos, Bangor University

Proceedings Production Editor

Dieter Fellner (TU Darmstadt & Fraunhofer IGD, Germany)

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 ©2019 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 978-3-03868-096-3

The electronic version of the proceedings is available from the Eurographics Digital Library at
<https://diglib.eg.org>

Table of Contents

Table of Contents	iii
International Programme Committee	v
Author Index	vii
Keynotes	viii

Virtual Reality

Virtual Reality Callouts - Demonstrating Knowledge With Spatial-Related Textual Information	1
<i>Robin Horst, Anika Degreif, Marvin Mathy, and Ralf Dörner</i>	
Assisting Serious Games Level Design with an Augmented Reality Application and Workflow	9
<i>Lee Beever, Serban Pop, and Nigel W. John</i>	
Optimising Underwater Environments for Mobile VR	19
<i>Llyr ap Cenydd and Christopher Headleand</i>	
Deformed Reality	27
<i>Antoine Petit, Nazim Haouchine, Frederick Roy, Daniel B. Goldman, and Stephane Cotin</i>	
A Somatic Approach to Combating Cybersickness Utilising Airflow Feedback	35
<i>Jake Harrington, Benjamin Williams, and Christopher Headleand</i>	
Generating High Fidelity Surface Meshes of Neocortical Neurons using Skin Modifiers	45
<i>Marwan Abdellah, Cyrille Favreau, Juan Hernando, Samuel Lapere, and Felix Schürmann</i>	
Fast and Efficient Nearest Neighbor Search for Particle Simulations	55
<i>Julian Gross, Marcel Köster, and Antonio Krüger</i>	
Evaluating Models for Virtual Forestry Generation and Tree Placement in Games	65
<i>Benjamin Williams, Panagiotis D. Ritsos, and Christopher Headleand</i>	

Simulation and Rendering

Accelerating Surface Tension Calculation in SPH via Particle Classification and Monte Carlo Integration	75
<i>Fernando Zorrilla, Johannes Sappl, Wolfgang Rauch, and Matthias Harders</i>	
Hash-based Hierarchical Caching for Interactive Previews in Global Illumination Rendering	85
<i>Thorsten Roth, Martin Weier, Pablo Bauszat, André Hinkenjann, and Yongmin Li</i>	

Posters

Deep Terrain Expansion: Terrain Texture Synthesis with Deep Learning	95
<i>Vasilis Toulatzis and Ioannis Fudos</i>	
Controlling 3D Visualisations with Multiple Degrees of Freedom	97
<i>Mario Sandoval, Tim Morris, and Martin Turner</i>	

Table of Contents

Comparing Gestural Interfaces using Kinect and OpenPose 103
Aminur Rahman, Louis G. Clift, and Adrian F. Clark

Computer Vision

Registration of 3D Triangular Models to 2D X-ray Projections Using Black-box Optimisation and X-ray Simulation 105
Tianci Wen, Radu P. Mihail, Shatha F. Al-Maliki, Jean M. Létang, and Franck P. Vidal

Robust and Flexible Puzzle Solving with Corner-based Cycle Consistent Correspondences 115
Taiwei Wang, Kristiyan Vladimirov, Shu Yu Goh, Yu-Kun Lai, Xianghua Xie, and Gary K. L. Tam

Short Papers

Projectional Radiography Simulator: an Interactive Teaching Tool 125
Aaron Sujar, Graham Kelly, Marcos García, and Franck P. Vidal

A Mesh Correspondence Approach for Efficient Animation Transfer 129
Anastasia Moutafidou and Ioannis Fudos

Recognising Human-Object Interactions Using Attention-based LSTMs 135
Muna Almushyti and Frederick W. B. Li

Towards a Tool for the Creation of Micro-visualisations 141
James Robert Jackson, Panagiotis D. Ritsos, and Jonathan C. Roberts

Sampling with Pinwheel Tiles 147
Abdalla G. M. Ahmed

Colour Processing in Adversarial Attacks on Face Liveness Systems 149
Latifah Abduh and Ioannis Ivrissimtzis

International Programme Committee

Alfie Abdul-Rahman, KCL
Daniel Archambault, Swansea University
Rita Borgo, King's College London Strand
Hamish Carr, University of Leeds
Llyr Ap Cenydd, Bangor University
Min Chen, University of Oxford
Nicholas Costen, Manchester Metropolitan University
Titas De, Indian Institute of Technology, Kharagpur
Kurt Debattista, Warwick University
Jingjing Deng, Swansea University
Alexandra Diehl, University of Konstanz
Michael Edwards, Swansea University
Hui Fang, Loughborough University
David George, Swansea University
Koulieris George, Durham University
Giuseppe Claudio Guarnera, NTNU
Edmond S. L. Ho, Northumbria University
Nick Holliman, Newcastle University
Ioannis Ivrissimtzis, Durham University
Atishay Jain, Adobe Systems
Mark Jones, Swansea University
Frédéric Labrosse, Aberystwyth University
Yu-Kun Lai, Cardiff University
Robert Laramee, Swansea University
Stephen Laycock, University of East Anglia
Frederick Li, Durham University
Steve Maddock, University of Sheffield
Rafal Mantiuk, University of Cambridge
Helen Miles, Aberystwyth University
Kenny Mitchell, Edinburgh Napier University
Benjamin Mora, Swansea University
Phong Nguyen, City, University of London
Amal Dev Parakkat, LIX, Ecole Polytechnique CNRS
Alexander Pasko, Skoltech, Russia / Bournemouth University, UK
Steve Pettifer, Manchester University
Serban Pop, University of Chester
Panagiotis D. Ritsos, Bangor University
Roy Ruddle, University of Leeds
Hyewon Seo, University of Strasbourg
Hubert P. H. Shum, Northumbria University
Ran Song, University of Brighton
Aaron Sújar, Universidad Rey Juan Carlos
Xianfang Sun, Cardiff University

International Programme Committee

Wen Tang, Bournemouth University
Bernard Tiddeman, Aberystwyth University
Martin Turner, Manchester University
Hassan Ugail, Bradford University
Peter Vangorp, Edge Hill University
Pierre-Frederic Villard, LORIA / University of Lorraine
Sean Walton, Swansea University
Tao Wan, Bradford University
Joss Whittle, Swansea University
Jing Wu, Cardiff University
Kai Xu, Middlesex University
Erica Yang, Science and Technology Facilities Council
Hui Yu, University of Portsmouth
Zhu Yufeng, University of British Columbia
Jian Jun Zhang, Bournemouth University
Reyer Zwiggelaar, Aberystwyth University

Author Index

Abdellah, Marwan	45	Lai, Yu-Kun	115
Abduh, Latifah	149	Lapere, Samuel	45
Ahmed, Abdalla G. M.	147	Létang, Jean M.	105
Al-Maliki, Shatha F.	105	Li, Frederick W. B.	135
Almushyti, Muna	135	Li, Yongmin	85
Bauszat, Pablo	85	Mathy, Marvin	1
Beever, Lee	9	Mihail, Radu P.	105
Cenydd, Llyr ap	19	Morris, Tim	97
Clark, Adrian F.	103	Moutafidou, Anastasia	129
Clift, Louis G.	103	Petit, Antoine	27
Cotin, Stephane	27	Pop, Serban	9
Degreif, Anika	1	Rahman, Aminur	103
Dörner, Ralf	1	Rauch, Wolfgang	75
Favreau, Cyrille	45	Ritsos, Panagiotis D.	65, 141
Fudos, Ioannis	95, 129	Roberts, Jonathan C.	141
García, Marcos	125	Roth, Thorsten	85
Goh, Shu Yu	115	Roy, Frederick	27
Goldman, Daniel B.	27	Sandoval, Mario	97
Gross, Julian	55	Sappl, Johannes	75
Haouchine, Nazim	27	Schürmann, Felix	45
Harders, Matthias	75	Sujar, Aaron	125
Harrington, Jake	35	Tam, Gary K. L.	115
Headland, Christopher	19, 35, 65	Toulatzis, Vasilis	95
Hernando, Juan	45	Turner, Martin	97
Hinkenjann, André	85	Vidal, Franck P.	105, 125
Horst, Robin	1	Vladimirov, Kristiyan	115
Ivrissimtzis, Ioannis	149	Wang, Taiwei	115
Jackson, James Robert	141	Weier, Martin	85
John, Nigel W.	9	Wen, Tianci	105
Kelly, Graham	125	Williams, Benjamin	35, 65
Köster, Marcel	55	Xie, Xianghua	115
Krüger, Antonio	55	Zorrilla, Fernando	75

Keynote

Carol O'Sullivan

Biographical Sketch

Carol O'Sullivan is the Professor of Visual Computing in Trinity College Dublin, and Head of the School of Computer Science and Statistics. From 2013-2016 she was a Senior Research Scientist at Disney Research in Los Angeles, and spent a sabbatical year as Visiting Professor in Seoul National University from 2012-2013. She joined TCD as a lecturer in 1997 and served as the Dean of Graduate Studies from Jul'2007 to Jul'2010. Her research interests include graphics and perception, Computer Animation, Crowd and Human simulation. She has managed a range of projects with significant budgets during that time and successfully supervised many doctoral and post-doctoral researchers. She has been a member of many editorial boards and international program committees (including ACM SIGGRAPH and Eurographics), and has served as Editor in Chief for the ACM Transactions on Applied Perception from 2006-2012. She has been program or general chair for several conferences, including the annual Eurographics conference in 2005, the ACM Symposium on Computer Animation in 2006, and is the Courses Chair for ACM SIGGRAPH Asia 2018. Prior to her PhD studies, she spent several years in industry working in Software Development. She was elected a fellow of Trinity College for significant research achievement in 2003 and of the European Association for Computer Graphics (Eurographics) in 2007.

Capstone

Rita Borgo

Biographical Sketch

Rita Borgo is a Senior Lecturer in the Department of Informatics at King's College London and is currently head of the Human Centred Computing Research Group. Her main research interests lie in the areas of information visualization and visual analytics, with particular focus on the role of human factors in visualization. Her research has followed an ambitious programme of developing new data visualization techniques for interactive rendering and manipulation of large multi-dimensional and multivariate datasets. Her research has been awarded support from the Royal Society, EPSRC and EU.