

Institute of Mathematics and its Applications Vision, Video, and Graphics 2005

University of Edinburgh July 7–8th, 2005

General Chair

Emanuele Trucco, Heriot Watt University, Edinburgh, UK

Program Chair

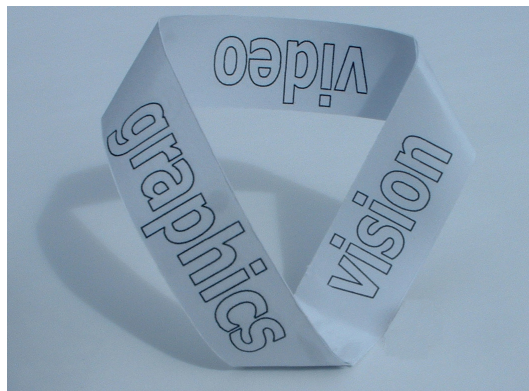
Mike Chantler, Heriot Watt University, UK

Area Chairs

Vision: Adrian Hilton, Univ of Surrey

Video: John Robinson, Univ of York

Graphics: Min Chen, Univ of Wales (Swansea)



Proceedings Production Editor

Dieter Fellner, TU Braunschweig

Sponsored by the IMA and EPSRC

In association with BMVA and the Eurographics Association

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 ©2005 by the Eurographics Association
PO Box 16, CH-1288 Aire-la-Ville, Switzerland

Published by the Eurographics Association
PO Box 16, CH-1288 Aire-la-Ville, Switzerland

Printed in Germany

Cover design by Stefanie Behnke

ISBN 3-905673-57-6

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

Table of Contents

Table of Contents	3
Preface	7
Sponsors	8
Keynote 1	
Visual Modeling: Unifying Graphics and Vision	9
<i>Demetri Terzopoulos</i>	
Animation	
Learnt Inverse Kinematics for Animation Synthesis	11
<i>Eng-Jon Ong and Adrian Hilton</i>	
A Rigid Transform Basis for Animation Compression and Level of Detail	21
<i>G. Collins and A. Hilton</i>	
Poster Session 1	
On the Separation of Luminance from Colour in Images	29
<i>Alan Woodland and Frédéric Labrosse</i>	
Multi-View Image Coding with Wavelet Lifting Scheme	37
<i>N. Anantrasirichai, C. Nishan Canagarajah, and David R. Bull</i>	
Texture Mapping Volume Objects	45
<i>P. Shen and P. Willis</i>	
Color Reduction by Using a new Self-Growing and Self-Organized Neural Network	53
<i>A. Atsalakis and N. Papamarkos</i>	
Modeling Falling and Accumulating Snow	61
<i>T. B. Moeslund, C. B. Madsen, M. Aagaard, and D. Lerche</i>	
Advances in Shadow Removing for Motion Detection Algorithms	69
<i>P. Spagnolo, T. D’Orazio, M. Leo, and A. Distanto</i>	
Different Medical Modelling Strategies in a Single Collaborative Immersive Virtual Environment	77
<i>A. Al-khalifah, R. McCrindle, and V. Alexandrov</i>	

Table of Contents

Keynote 2

3D Image Analysis and Synthesis at MPI Informatik	85
<i>Christian Theobalt, Marcus A. Magnor, and Hans-Peter Seidel</i>	

Motion, Synthesis and Computational Methods

Sensitivity Analysis in Image Synthesis	93
<i>M. Trujillo and E. Izquierdo</i>	
Rigorous Computing in Computer Vision	101
<i>Michela Farenzena and Andrea Fusiello</i>	
Motion Analysis in Video: Dolls, Dynamic Cues and Modern Art	109
<i>J. P. Collomosse and P. M. Hall</i>	
Monte Carlo Noise Reduction Using Bayesian Method in Wavelet domain	117
<i>Ruifeng Xu and Sumanta N. Pattanaik</i>	

Multiple Views and 3-D

SVD-Matching using SIFT Features	125
<i>Elisabetta Delponte, Francesco Isgrò, Francesca Odone, and Alessandro Verri</i>	
Depth Enhanced Panoramas	133
<i>Gleb Bahmutov, Voicu Popescu, Mihai Mudure, and Elisha Sacks</i>	

Multiple Views and 3-D

Adaptive Grid Optical Tomography	141
<i>Ivo Ihrke and Marcus Magnor</i>	
Correspondenceless Stereo for 3-D Iris Location	149
<i>Tom Anderson, Emanuele Trucco, and Marco Razeto</i>	

Keynote 3

Talking Faces - Technologies and Applications	157
<i>Jörn Ostermann, Axel Weissenfeld, and Kang Liu</i>	

Image Matching, Recognition, and Retrieval

Visual Recognition of Man-made Materials and Structures in an Office Environment	159
<i>Y. Z. Song, and C. P. Town</i>	

Table of Contents

A New Framework for Trademark Retrieval Based on Size Functions	167
<i>A. Cerri, M. Ferri, and D. Giorgi</i>	
Image classification using compression distance	173
<i>Yuxuan Lan and Richard Harvey</i>	
Poster Session 2	
Bitvectors for Robust Hierarchical Template Matching	181
<i>David Tweed</i>	
Merging Graphics and Vision for 3D Face Recognition	189
<i>Li Bai and Yi Song</i>	
Linear Hashtable Method and Predicted Hexagonal Search Algorithm with Moments Invariant	195
<i>Yunsong Wu, Graham Megson, Zhengang Nie, and Xuan Liu</i>	
Automatic Non-Photorealistic Rendering through Soft-Shading Removal: A Colour-Vision Approach	203
<i>A. Olmos and F. A. A. Kingdom</i>	
Keynote 4	
Use of Computer Vision/ Computer Graphics Collaboration for 3D Rotoscopy	209
<i>André Gagalowicz</i>	
Rendering	
Natural Image Matting	211
<i>Peter M. Hillman and John M. Hannah</i>	
Regularised Anisotropic Nonlinear Diffusion for Rendering Refraction in Volume Graphics	219
<i>David Rodgman and Min Chen</i>	
Realistic Real-Time Hair Simulation and Rendering	229
<i>Yvonne Jung, Alexander Rettig, Oliver Klar, and Timo Lehr</i>	
A Model-Based Approach to Image Relighting with a Potential for Real-Time Implementation	237
<i>Claus B. Madsen and Rune Laursen</i>	
Scientific Committee	245
Author Index	246

Preface

It is our great pleasure to introduce the proceedings of VVG'05, the Second International Conference on Video, Vision and Graphics. This event follows the first, successful conference at Bath in July 2003.

There has never been a more exciting moment to work in this area. As technology moves forward relentlessly, memory becomes ever cheaper and more powerful, bandwidths larger, and processors faster and faster. It is now possible with relatively little effort and certainly limited costs to set up complex multi-view, multi-screen systems with large numbers of digital cameras and programable graphics cards that process video data quantities unimaginable not that many years ago. At the same time, we are witnessing the emergence of new applications, from mobile and wireless communications to immersive collaborative environments, from reverse engineering of large-scale objects to video post-production.

VVG'05 confirms its position as an ideal opportunity to discuss and present convergence research. It remains a mainly academic forum, designed to attract high-quality presentations and ignite technical discussion among researchers moving through the fertile territory straddling computer vision, computer graphics and video communications.

We are indebted to all those who contributed in many different ways to VVG'05. Thank you to André Gagalowicz, Joern Ostermann, Hans-Peter Seidel, and Demetri Terzopoulos, the VVG'05 invited speakers, for their attendance and contributions. We thank Adrian Hilton, Min Chen and John Robinson, Area Chairs for Vision, Graphics and Video areas respectively, for their work on reviewing and publicity. A warm thank you to the whole technical committee for their work and time. We are fortunate to have the Institute of Mathematics and its Applications (IMA) as main sponsor of this event; we thank especially Lucy Nye for her assistance throughout the last year, David Youdan, and also Ralph Martin for starting the whole VVG adventure in 2002. Thank you to Stefanie Behnke and Dieter Fellner of Eurographics for taking care of proceedings production very efficiently. VVG'05 runs under the combined auspices of IMA, EPSRC, Eurographics and the British Machine Vision Association; we thank all these organisations for their support.

And last but not least, thank you to all the authors and delegates, the ultimate *raison d'être* of any conference.

We wish you all a successful, stimulating and enjoyable conference.

Emanuele Trucco and Mike Chantler

Sponsors



Institute for Mathematics and its Applications



Engineering and Physical Sciences Research Council

In association with:

BMVA

British Machine Vision Association



Eurographics Association