

**The 16-th International Conference in Central Europe on Computer
Graphics, Visualization and Computer Vision**

in co-operation with

EUROGRAPHICS

W S C G ' 2008

Full Papers

University of West Bohemia
Plzen
Czech Republic

February 4 - 7, 2008

Honourary Chair

Wolfgang Strasser, University of Tuebingen, Germany

Co-Chairs

**Steve Cunningham, California State University, USA
Vaclav Skala, University of West Bohemia, Czech Republic**

Edited by

Steve Cunningham
Vaclav Skala

WSCG'2008 Full Papers Proceedings

Editor-in-Chief: Vaclav Skala
University of West Bohemia, Univerzitni 8, Box 314
CZ 306 14 Plzen
Czech Republic
skala@kiv.zcu.cz

Managing Editor: Vaclav Skala

Author Service Department & Distribution:
Vaclav Skala - UNION Agency
Na Mazinách 9
322 00 Plzen
Czech Republic

Printed at the University of West Bohemia

Hardcopy: *ISBN 978-80-86943-15-2*

WSCG 2008

International Programme Committee

Baranoski, G. (Canada)	Myszkowski, K. (Germany)
Bartz, D. (Germany)	Pasko, A. (United Kingdom)
Benes, B. (United States)	Peroche, B. (France)
Biri, V. (France)	Puppo, E. (Italy)
Bouatouch, K. (France)	Purgathofer, W. (Austria)
Coquillart, S. (France)	Rokita, P. (Poland)
Csebfalvi, B. (Hungary)	Rosenhahn, B. (Germany)
Cunningham, S. (United States)	Rossignac, J. (United States)
Davis, L. (United States)	Rudomin, I. (Mexico)
Debelov, V. (Russia)	Sbert, M. (Spain)
Deussen, O. (Germany)	Shamir, A. (Israel)
Ferguson, S. (United Kingdom)	Schumann, H. (Germany)
Goebel, M. (Germany)	Skala, V. (Czech Republic)
Groeller, E. (Austria)	Teschner, M. (Germany)
Chen, M. (United Kingdom)	Theoharis, T. (Greece)
Chrysanthou, Y. (Cyprus)	Triantafyllidis, G. (Greece)
Jansen, F. (The Netherlands)	Veltkamp, R. (Netherlands)
Jorge, J. (Portugal)	Wu, S. (Brazil)
Klosowski, J. (United States)	Zara, J. (Czech Republic)
Lee, T.-Y. (Taiwan)	Zemcik, P. (Czech Republic)
Magnor, M. (Germany)	

WSCG 2008

Board of Reviewers

Adzhiev, V. (United Kingdom)
Albuquerque, G. (Germany)
Andreadis, I. (Greece)
Andujar, C. (Spain)
Aspragathos, N. (Greece)
Avenueau, L. (France)
Bair, A. (United States)
Bamidis, P. (Greece)
Baranoski, G. (Canada)
Battiato, S. (Italy)
Bellon, O. (Brazil)
Benes, B. (United States)
Bernhard, M. (Austria)
Biri, V. (France)
Bittner, J. (Czech Republic)
Borchani, M. (France)
Bottino, A. (Italy)
Bouatouch, K. (France)
Bouville, C. (France)
Bruni, V. (Italy)
Buehler, K. (Austria)
Carmen Juan-Lizandra, M. (Spain)
Casciola, G. (Italy)
Coleman, S. (United Kingdom)
Comba, J. (Brazil)
Coquillart, S. (France)
Csebfalvi, B. (Hungary)
Daniel, M. (France)
Davis, L. (United States)
de Geus, K. (Brazil)
Debelov, V. (Russia)
Delrieux, C. (Argentina)
Deussen, O. (Germany)
Dingliana, J. (Ireland)
Doleisch, H. (Austria)
Duce, D. (United Kingdom)
Durikovic, R. (Slovakia)
Egges, A. (Netherlands)
Eisemann, M. (Germany)
Erbacher, R. (United States)
Feito, F. (Spain)
Felkel, P. (Czech Republic)
Ferguson, S. (United Kingdom)
Fernandes Marcos, A. (Portugal)
Fernandes, A. (Portugal)
Flaquer, J. (Spain)
Flórez, J. (United States)
Forest, V. (France)
Franke, T. (Germany)
Fuchs, R. (Austria)
Galín, E. (France)
Gallo, G. (Italy)
Galo, M. (Brazil)
Galvez, A. (Spain)
Garcia-Alonso, A. (Spain)
Giannini, F. (Italy)
Gonzalez, P. (Spain)
Groeller, E. (Austria)
Gudukbay, U. (Turkey)
Gumbau, J. (Spain)
Gupta, A. (United States)
Gutierrez, D. (Spain)
Habel, R. (Austria)
Hanak, I. (Czech Republic)
Haro, A. (United States)
Hasler, N. (Germany)
Havemann, S. (Austria)
Havran, V. (Czech Republic)
Hernandez, B. (Mexico)
Horain, P. (France)
House, D. (United States)
Huang, C. (Taiwan)
Chaudhuri, D. (India)
Chen, M. (United Kingdom)
Chen, T.F. (Canada)
Chin, S. (Korea)
Chover, M. (Spain)
Chrysanthou, Y. (Cyprus)
Iglesias, A. (Spain)
Iwanowski, M. (Poland)
Janda, M. (Czech Republic)
Jansen, F. (Netherlands)
Joan-Arinyo, R. (Spain)
Jorge, J. (Portugal)
Kavan, L. (Ireland)
Keller, K. (United States)
Kimmel, B. (Canada)
Kjell Dahl, L. (Sweden)
Klosowski, J. (United States)
Knight, M. (United Kingdom)
Kohout, J. (Czech Republic)
Kolcun, A. (Czech Republic)

Krishnaswamy,A. (Canada)
Lee,T. (Taiwan)
Lewis,J. (United States)
Lin,W. (Taiwan)
Lintu,A. (Germany)
Liu,S. (Taiwan)
Maciel,A. (Brazil)
Magnor,M. (Germany)
Maierhofer,S. (Austria)
Mandl,T. (Germany)
Matkovic,K. (Austria)
Mattausch,O. (Austria)
McMenemy,K. (United Kingdom)
Michoud,B. (France)
Mokhtari,M. (Canada)
Mollá Vayá,R. (Spain)
Montrucchio,B. (Italy)
Mould,D. (Canada)
Muigg,P. (Austria)
Muller,H. (Germany)
Myszkowski,K. (Germany)
Nedel,L. (Brazil)
Netto,M. (Brazil)
Odone,F. (Italy)
Ogayar,C. (Spain)
Pan,Z. (China)
Papadakis,P. (Greece)
Pasko,A. (United Kingdom)
Pasko,G. (Japan)
Patera,J. (Czech Republic)
Patil,S. (India)
Paulin,M. (France)
Pedrini,H. (Brazil)
Pelikan,J. (Czech Republic)
Peroche,B. (France)
Pili,P. (Italy)
Platis,N. (Greece)
Plemenos,D. (France)
Podgorelec,D. (Slovenia)
Pratikakis,I. (Greece)
Puig,A. (Spain)
Puppo,E. (Italy)
Purgathofer,W. (Austria)
Ramires Fernandes,A. (Portugal)
Redon,S. (France)
Reichinger,A. (Austria)
Renaud,c. (France)
Ripolles,O. (Spain)
Ritschel,T. (Germany)
Rojas-Sola,J. (Spain)
Rokita,P. (Poland)
Rosenhahn,B. (Germany)
Rossignac,J. (United States)
Rudomin,I. (Mexico)
Sanna,A. (Italy)
Sbert,M. (Spain)
Segundo,M. (O)
Segura,R. (Spain)
Sellent,A. (Germany)
Semwal,S. (United States)
Shamir,A. (Israel)
Schmaltz,C. (Germany)
Schmidt,T. (Germany)
Schneider,B. (United States)
Schumann,H. (Germany)
Singh,M. (United States)
Sips,M. (United States)
Sirakov,N. (United States)
Stanchak,R. (United States)
Stroud,I. (Switzerland)
Suarez Rivero,J. (Spain)
Svoboda,T. (Czech Republic)
Sýkora,D. (Czech Republic)
Teschner,M. (Germany)
Theoharis,T. (Greece)
Theußl,T. (Austria)
Tokuta,A. (United States)
Torrens,F. (Spain)
Triantafyllidis,G. (Greece)
Tytkowski,K. (Poland)
Van Basten,B. (Netherlands)
Van Laerhoven,T. (Belgium)
Vanecek,P. (Czech Republic)
Vasa,L. (Czech Republic)
Veeraraghavan,A. (United States)
Veiga,L. (Portugal)
Vergeest,J. (Netherlands)
Verlinden,J. (Netherlands)
Vitulano,D. (Italy)
Wagner,S. (Germany)
Wan,T. (United Kingdom)
Weiss,G. (Germany)
Wu,S. (Brazil)
Wuethrich,C. (Germany)
You,S. (United States)
Zach,C. (Austria)
Zachmann,G. (Germany)
Zalik,B. (Slovenia)
Zambal,S. (Austria)
Zara,J. (Czech Republic)
Zemcik,P. (Czech Republic)
Zhu,Y. (United States)

FOREWORD

This book contains the abstract proceedings of **WSCG'2008**, the 16th International Conference in Central Europe on Computer Graphics, Visualization and Computer Vision 2008.

Since its starting point in 1992 with about 20 participants from the former Czechoslovakia, it has become an important event on the international Computer Graphics conference calendar.

Submissions to WSCG'2008 came from five continents, including 16 countries in Europe. From these 186 submissions, 159 papers were sent to reviewers, each to be reviewed by at least three experts from the large International Program Committee or external members of the Board of Reviewers. Of these, 47 papers have been accepted to be presented as full papers at WSCG'08, representing a 29,6 % acceptance ratio. The best 20 of these papers have been selected to be published in a special issue of the Journal of WSCG (<http://wscg.zcu.cz/jwscg>).

There were many very good papers reporting on projects in progress submitted and they were accepted as Communication or poster papers as they present research ideas with high research potential.

All the papers accepted will be available through the conference Digital Library at http://wscg.zcu.cz/DL/wscg_DL.htm. The published papers are also listed on the major international scientific indexes.

WSCG'2008 features three keynote lectures:

- *The Visual Computing of Projector-Camera Systems*, Oliver Bimber, University of Weimar, Germany
- *Perception-Based Integration of Vision and Touch in Virtual Environments*, Anatole Lecuyer, INRIA, Rennes, France
- *Virtual Iraq: Initial Results from a VR Exposure Therapy Application for Combat-Related Post Traumatic Stress Disorder*, Albert Rizzo et al., University of Southern California, USA

Finally, we would like to express our thanks to all the authors who submitted technical papers to WSCG'2008, and to the reviewers whose work and dedication made it possible to put together a very exciting program of high technical quality.

The Program Co-Chairs

Steve Cunningham, California State University Stanislaus, Turlock, California, USA
Vaclav Skala, University of West Bohemia, Plzen, Czech Republic

Plzen, January 20, 2007

WSCG 2008 Full Papers

Contents

Title	Page
Rizzo,A., Pair,J., Graap,K., Rothbaum,B.O., Difede,J., Reger,G., Parsons,T., Mclay,R.N., Perlman,K.: Virtual Iraq: Initial Results from a VR Exposure Therapy Application for Combat-Related Post Traumatic Stress Disorder	i
Bimber,O.: The Visual Computing of Projector-Camera Systems	i
Lécuyer,A.: Perception-Based Integration of Vision and Touch in Virtual Environments	ii
Khan,M., Ohno,Y.: Compression of Temporal Video Data by Catmull-Rom Spline and Quadratic Bezier Curve Fitting	1
Park,A., Mukovskiy,A., Omlor,L., Giese,M.: Synthesis of Character Behavior by Dynamic Interaction of Synergies Learned from Motion Capture Data	9
Ropinski,T., Kasten,J., Hinrichs,K.: Efficient Shadows for GPU-based Volume Raycasting	17
Klimenko,S., Mestetskiy,L., Semenov,A.: Handwritten Fonts Modeling Based on Fat Lines of Variable Width	25
Schreck,T., Schuessler,M., Zeilfelder,F., Worm,K.: Butterfly Plots for Visual Analysis of Large Point Cloud Data	33
Hulusic,V., Aranha,M., Chalmers,A.: The Influence of Cross-modal Interaction on Perceived Rendering Quality Thresholds	41
Feichtinger,R., Yang,H., Jüttler,B.: Particle-based T-Spline Level Set Evolution with Range and Volume Constraints	49
Bayar,A., Sami,K.: An Optimal Way to Encode the Outlines of Variable Sized Arabic Letters in a PostScript Font	57
Schnabel,R., Wessel,R., Wahl,R., Klein,R.: Shape Recognition in 3D Point-Clouds	65
Wessel,R., Bluemel,I., Klein,R.: The Room Connectivity Graph: Shape Retrieval in the Architectural Domain	73
Schoor,W., Bollenbeck,F., Hofmann,M., Mecke,R., Seiffert,U., Preim,B.: Automatic Zoom and Pseudo Haptics to Support Semiautomatic Segmentation Tasks	81
Hernandez,J.T., Calderon,J.M.: Automatic Axis Extraction from `Tubular` Structures in CT Images - An Application in Virtual Colonoscopy	89
Lorenz,H., Doellner,J.: Dynamic Mesh Refinement on GPU using Geometry Shaders	97

Redmond,N., Dingliana,J.: A Hybrid Technique for Creating Meaningful Abstractions of Dynamic 3D Scenes in Real-Time	105
Luboschik,M., Schumann,H.: Discovering the Covered: Ghost Views in Information Visualization	113
Rianto,S., Li,L., Squelch,A. Hartley,B.M.: Fluid Dynamic Simulation for Multilayer Cutting in Virtual Environment	119
Pignatel,A., Farella,E., Brevi,F., Benini,L., Gaiani,M.: On the use of a Palm Computer for Design Review Interaction in a Virtual Room	127
Wang,H., Zhang,T., Li,P.: From Bag of Categories to Tree of Object Recognition	135
Sampaio,A.Z., Henriques,P.G.: Visual Simulation of Civil Engineering Activities: Didactic Virtual Models	143
Dodo,M., Andriamanampisoa,F., Torguet,P., Jessel,J.P.: New Method to Optimize Force-directed Layouts of Large Graphs	151
Barandiaran,I., Cottez,Ch., Paloc,C., Grana,M.: Comparative Evaluation of Random Forest and Ferns Classifiers for Real-Time Feature Matching	159
Bayer,A.O., Sevinc,A.M., Can,T.: Human Skeletal and Muscle Deformation Animation Using Motion Capture Data	167
Lucena,M.J., Fuertes,J.M., Pérez,N.: Spatially Constrained Model for Mean Shift	175
Blasco,J., Escriva,M., Abad,F., Quiros,R., Camahort,E., Vivo,R.: A Generalized Light-Field API and Management System	183
Wolfe,T., Semwal,S.K.: Acousting Modeling of Reverberation using Smooth Particle Hydrodynamics	191
Langerak,T.R.: Geometric Feature Deletion Through Freeform Feature Recognition	199
Dumazet,S., Callet,P., Genty,A.: Spectral Modeling and Virtual Restoration on a Polychrome Medieval Sculpture	207