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Citizenship: German

Research interests

Computer graphics and vision. In particular, I am interested in the fields of video and light field processing, stereoscopy, image-based rendering and 3D reconstruction, and 2D animation and games.

Education

- 08/2003 – 10/2008 RWTH-Aachen University, Germany
Doctorate in Computer Science (Dr. rer. nat., with highest distinction)
Thesis: Shape Representations for Image-based Applications.
Supervised by Prof. Leif Kobbelt
- 10/1997 – 03/2003 RWTH-Aachen University, Germany
Diplom in Computer Science (with highest distinction)
Thesis: Autonomous Real-Time Camera Agents in Interactive Narratives and Games.
Supervised by Prof. Gerhard Lakemeyer and Prof. Georg Trogemann

Work experience

- 10/2010 – present **Research Scientist**
Disney Research Zurich, Switzerland
- 11/2009 – 09/2010 **Postdoctoral researcher**
Disney Research Zurich, Switzerland
- 11/2008 – 10/2009 **Postdoctoral researcher**
Computer Graphics Laboratory, Institute for Visual Computing
Swiss Federal Institute of Technology (ETH) Zurich, Switzerland
- 04/2003 – 07/2003 **Research associate**
Laboratory for Mixed Realities
Academy of Media Arts, Cologne, Germany
- 05/2001 – 01/2003 **Founder and executive board member**
IT-Develop AG, Aachen, Germany
- 04/2001 – 12/2001 **Volunteer coach**
Startsocial Initiative by McKinsey, Gerling, and Pro7, Cologne, Germany

- 12/1999 – 03/2002 **Student researcher**
Virtual Reality Center Aachen (VRCA), Aachen, Germany
- 08/1997 – 07/2003 **Freelance web-developer**
Aachen, Germany
- 07/1997 – 08/1997 **Internship web-development**
RB Presse-Data

Awards and fellowships

- 2010 Borchers-Plakette, excellence award for outstanding PhD dissertation, RWTH-Aachen University
- 2005 Best paper award, GI-Fachgruppe VR/AR
- 2004 Multimedia Transfer Award for Diplom thesis, Karlsruhe University
- 2004 Springorum-Denkmünze, award for Diplom with highest distinction, RWTH-Aachen University
- 2003 GI-Tweenwork Award for outstanding interdisciplinary student projects, 2nd prize
- 2002 IGDA GDC Europe Student scholarship
- 2001 – 2003 e-fellows.net scholarship

Publications

Edited volumes

- [1] Thomas Deselaers, Alexander Hornung and Olga Sorkine, editors. Proceedings of the ECCV Media Retargeting Workshop, September 10, 2010.

Journal publications

- [2] Multi-Perspective Stereoscopy from Light Fields. Changil Kim, Alexander Hornung, Simon Heinze, Wojciech Matusik and Markus Gross. ACM Transactions on Graphics, Vol. 30(6), 2011 (*ACM SIGGRAPH ASIA 2011 Proceedings issue*).
- [3] OSCAM - Optimized Stereoscopic Camera Control for Interactive 3D. Thomas Oskam, Alexander Hornung, Huw Bowles, Kenny Mitchell and Markus Gross. ACM Transactions on Graphics, Vol. 30(6), 2011 (*ACM SIGGRAPH ASIA 2011 Proceedings issue*).
- [4] Topology-Driven Vectorization of Clean Line Drawings. Gioacchino Noris, Alexander Hornung, Maryann Simmons, Robert Sumner and Markus Gross. ACM Transactions on Graphics, accepted.
- [5] Three-Dimensional Video Postproduction and Processing. Aljoscha Smolic, Peter Kauff, Sebastian Knorr, Alexander Hornung, Matthias Kunter, Marcus Müller and Manuel Lang. Proceedings of the IEEE, Vol. 99(4), 2011
- [6] Novel Stereoscopic Content Production Tools. Alexander Hornung, Aljoscha Smolic and Markus Gross. SMPTE Motion Imaging Journal, May/June 2011.
- [7] Nonlinear Disparity Mapping for Stereoscopic 3D. Manuel Lang, Alexander Hornung, Oliver Wang, Steven Poulakos, Aljoscha Smolic and Markus Gross. ACM Transactions on Graphics, Vol. 29(4), 2010 (*ACM SIGGRAPH 2010 Proceedings issue*).
- [8] Articulated Billboards for Video-based Rendering. Marcel Germann, Alexander Hornung, Richard Keiser, Remo Ziegler, Stephan Würmlin and Markus Gross. Computer Graphics Forum, Vol. 29(2), pp. 585-594, 2010 (*EUROGRAPHICS 2010 Proceedings issue*).
- [9] A System for Retargeting of Streaming Video. Philipp Krähenbühl, Manuel Lang, Alexander Hornung and Markus Gross. ACM Transactions on Graphics, Vol. 28(5), 2009 (*ACM SIGGRAPH ASIA 2009 Proceedings issue*).
- [10] Interactive Pixel-Accurate Free Viewpoint Rendering from Images with Silhouette Aware Sampling. Computer Graphics Forum, Vol. 28(8), pp. 2090-2103, 2009.
- [11] Character Animation from 2D Pictures and 3D Motion Data. Alexander Hornung, Ellen Dekkers and Leif Kobbelt. ACM Transactions on Graphics, Vol. 26(1), 2007, *Among Top 10 Downloads from ACMs Digital Library in March 2007*.
- [12] Robust and Efficient Photo-Consistency Estimation for Volumetric 3D Reconstruction. Alexander Hornung and Leif Kobbelt. Lecture Notes in Computer Science, Vol. 3952, pp. 179-190, 2006 (*European Conference on Computer Vision (ECCV) 2006 Proceedings issue*).
- [13] Automatic Data Normalization and Parameterization for Optical Motion Tracking. Sandip Sar-Dessai, Alexander Hornung and Leif Kobbelt. Journal of Virtual Reality and Broadcasting (JVRB), Vol. 3, 2006.
- [14] Visualisation of Eclipses and Planetary Conjunction Events. The Interplay between Model Coherence, Scaling and Animation. Walter Oberschelp, Alexander Hornung and Horst Samulowitz. The Visual Computer, Vol. 17(5), pp. 310-317, 2001.

Peer-reviewed international conference publications

- [15] Temporal Noise Control for Sketchy Animations. Gioacchino Noris, Daniel Sykora, Stelian Coros, Brian Whited, Maryann Simmons, Alexander Hornung, Markus Gross and Robert Sumner. International Symposium on Non-Photorealistic Animation and Rendering (NPAR) 2011.
- [16] StereoBrush: Interactive 2D to 3D Conversion Using Discontinuous Warps. Oliver Wang, Manuel Lang, Matthias Frei, Alexander Hornung, Aljoscha Smolic and Markus Gross. International Symposium on Sketch-Based Interfaces and Modeling (SBIM) 2011.
- [17] Extending SVC by Content-Adaptive Spatial Scalability. Yongzhe Wang, Nikolce Stefanoski, Manuel Lang, Alexander Hornung, Aljoscha Smolic and Markus Gross. IEEE International Conference on Image Processing (ICIP) 2011.
- [18] Disparity-aware Stereo 3D Production Tools. Aljoscha Smolic, Steven Poulakos, Simon Heinzle, Pierre Greisen, Manuel Lang, Alexander Hornung, Miquel Farre, Nikolce Stefanoski, Oliver Wang, Lars Schnyder, Rafael Monroy and Markus Gross. European Conference on Visual Media Production 2011.
- [19] Automatic Content Creation for Multiview Autostereoscopic Displays using Image Domain Warping. Miquel Farre, Oliver Wang, Manuel Lang, Nikolce Stefanoski, Alexander Hornung and Aljoscha Smolic. IEEE International Workshop on Hot Topics in 3D 2011.
- [20] Evaluation of Backward Mapping DIBR for FVV Applications. Daniel Berjon, Alexander Hornung, Francisco Moran and Aljoscha Smolic. IEEE International Workshop on Hot Topics in 3D 2011.
- [21] Non-linear Warping and Warp Coding for Content-Adaptive Prediction in Advanced Video Coding Applications. Aljoscha Smolic, Yongzhe Wang, Nikolce Stefanoski, Manuel Lang, Alexander Hornung and Markus Gross. IEEE International Conference on Image Processing (ICIP) 2010.
- [22] Image Selection For Improved Multi-View Stereo. Alexander Hornung, Boyi Zeng and Leif Kobbelt. IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2008.
- [23] City Virtualization. Gregor Fabritius, Jan Krassnigg, Lars Krecklau, Christopher Manthei, Alexander Hornung, Martin Habbecke and Leif Kobbelt. 5. Workshop Virtuelle und Erweiterte Realität der GI-Fachgruppe VR/AR 2008.
- [24] Robust Reconstruction of Watertight 3D Models from Non-uniformly Sampled Point Clouds Without Normal Information. Alexander Hornung and Leif Kobbelt. Eurographics Symposium on Geometry Processing (SGP) 2006.
- [25] Hierarchical Volumetric Multi-view Stereo Reconstruction of Manifold Surfaces based on Dual Graph Embedding. Alexander Hornung and Leif Kobbelt. IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2006, *oral presentation, acceptance ratio 4.8%*.
- [26] Automatic Data Normalization and Parameterization for Optical Motion Tracking. Sandip Sardesai, Alexander Hornung and Leif Kobbelt. 2. Workshop Virtuelle und Erweiterte Realität der GI-Fachgruppe VR/AR 2005, *best paper award*.
- [27] High Quality Splatting on Today's GPUs. Mario Botsch, Alexander Hornung, Matthias Zwicker and Leif Kobbelt. ACM and EUROGRAPHICS Symposium on Point-Based Graphics (PBG) 2005.
- [28] Self-Calibrating Optical Motion Tracking for Articulated Bodies. Alexander Hornung, Sandip Sardesai and Leif Kobbelt. IEEE Virtual Reality Conference (VR) 2005.
- [29] The Virtual Real-Time Dramaturge: Formalisation of Dramaturgic Principles. Richard Wages and Alexander Hornung. International Conference on Virtual Systems and Multimedia (SVMM) 2005.
- [30] Robust and Automatic Optical Motion Tracking. Alexander Hornung and Leif Kobbelt. 1. Workshop Virtuelle und Erweiterte Realität der GI-Fachgruppe VR/AR 2004.

- [31] An Autonomous Real-Time Camera Agent for Interactive Narratives and Games. Alexander Hornung, Gerhard Lakemeyer and Georg Trogemann. Intelligent Virtual Agents (IVA) 2003.

Technical reports

- [32] Character Reconstruction and Animation from Uncalibrated Video. Alexander Hornung, Ellen Dekkers, Martin Habbecke, Markus Gross and Leif Kobbelt. Technical report, RWTH-Aachen, 2010.

Theses

- [33] Alexander Hornung. Shape Representations for Image-based Applications. Ph.D. Thesis. RWTH-Aachen University, Shaker Verlag Aachen, 2009.
- [34] Alexander Hornung. Autonomous Real-Time Camera Agents in Interactive Narratives and Games. Diplom Thesis. RWTH-Aachen University, 2003.

Professional activities

Program chair

2010 ECCV Workshop on Media Retargeting

Program committee member

2011 EUROGRAPHICS Papers
International Conference on Computer Vision (ICCV) Papers
Shape Modeling International Papers
SIBGRAPI Papers

2010 EUROGRAPHICS Papers

Reviewer

Journals: ACM Transactions on Graphics, IEEE Transactions on Visualization and Computer Graphics, IEEE Computer Graphics and Applications, Proceedings of the IEEE, Computer Graphics Forum, Computer Aided Geometric Design, Signal Processing: Image Communication, Journal of Virtual Reality and Broadcasting.

Conferences: ACM SIGGRAPH, ACM SIGGRAPH ASIA, EUROGRAPHICS, Pacific Graphics, 3DPVT, IEEE Virtual Reality, Shape Modeling International, Geometric Modeling and Processing, Vision, Modeling, and Visualization, SIBGRAPI, Winter School on Computer Graphics.

Teaching and supervision

Mentored PhD students and postdocs

08/2011 – present Y. Pritch, Disney Research postdoc
10/2011 – present K. Yücer, PhD student
12/2010 – present C. Kim, PhD student
11/2010 – present T. Oskam, PhD student
11/2008 – present G. Noris, PhD student
11/2008 – present M. Lang, PhD student

11/2008 – 10/2009 R. Adelsberger, PhD student
11/2008 – 10/2009 M. Germann, PhD student

Mentored interns

10/2011 – present H. Zimmer
11/2010 – present F. Perazzi
09/2010 – 11/2010 M. Farre
08/2010 – 10/2010 D. Berjon

Mentored Masters and Bachelor students

2011 T. Siegrist
2011 K. Yücer
2011 S. Hänger
2009 S. Bünter
2009 P. Krähenbühl
2007 E. Dekkers
2007 B. Zeng
2007 Y. Kangöz
2006 C. Vogel
2006 W. Liao
2005 S. Sar-Dessai
2004 M. Habbecke
2004 T. Huppertz

Teaching

Computer Science Department, ETH Zurich, Switzerland

Fall 2010 Computer Graphics Lecture
Spring 2010 Practical Course: Game Programming Lab
Fall 2009 Computer Graphics Lecture
Spring 2009 Practical Course: Game Programming Lab

Computer Science Department, RWTH-Aachen University, Germany

Spring 2008 Practical Course: The Virtual Aachen Project
Fall 2007 Computer Graphics I Lecture
Spring 2007 Practical Course: The Virtual Aachen Project
Fall 2006 Computer Graphics I Lecture
Spring 2006 Practical Course: Building a Vision-based 3D Scanner
Fall 2005 B-IT Seminar: Current Research Topics in Computer Graphics
Practical Course: Introduction to Computer Graphics
Spring 2005 Practical Course: Special Effects
Fall 2004 Seminar: Point- and Image-based Rendering Techniques
Spring 2004 Practical Course: Special Effects