

EDUCATION

- **Ph.D. in Computer Science**, UNIVERSITY OF CALIFORNIA, SAN DIEGO SEPTEMBER 2008
Research Area: Computer Graphics
Advisors: Henrik Wann Jensen & Matthias Zwicker
Dissertation: *Efficient Monte Carlo Methods for Light Transport in Scattering Media*.
- **M.S. in Computer Science**, UNIVERSITY OF CALIFORNIA, SAN DIEGO MARCH 2006
Research Area: Computer Graphics
Advisor: Henrik Wann Jensen
- **B.S in Computer Science**, UNIVERSITY OF ILLINOIS, URBANA-CHAMPAIGN MAY 2003
Highest Honors
Research Area: Computer Graphics
Advisors: John C. Hart & Michael Garland
Senior Thesis: *Interactive Global Illumination for Improved Lighting Design Workflow*.

RESEARCH INTERESTS

My research is concerned with the derivation of *theoretical models* and the development of efficient *computational algorithms* for the visual simulation of natural phenomena. My work explores practical applications in a variety of areas in computer graphics rendering including: participating media^[8-10,12,17-19,22-24,29,36,37]; complex illumination and materials^[14-16,20,25,31]; global illumination^[17-19,25,39]; Monte Carlo methods and efficient sampling^[14-16,20,21]; and high-dynamic range imaging^[40].

RESEARCH & WORK EXPERIENCE

- **Research Scientist at DISNEY RESEARCH, ZÜRICH** SEPTEMBER 2010 – PRESENT
Head of Rendering Team
The Walt Disney Company (Switzerland) GmbH
- **Post-Doctoral Researcher at DISNEY RESEARCH, ZÜRICH** MARCH 2009 – SEPTEMBER 2010
Walt Disney Studios (Switzerland) Ltd.
Host: Markus Gross
- **Post-Doctoral Researcher at UC SAN DIEGO** OCTOBER 2008 – FEBRUARY 2009
Department of Computer Science & Engineering
Host: Henrik Wann Jensen
- **Research Intern at ADOBE SOFTWARE SYSTEMS** SUMMER 2008
Advanced Technology Labs
Host: Nathan Carr
- **Graduate Student Researcher at UC SAN DIEGO** JANUARY 2004 – SEPTEMBER 2008
Department of Computer Science & Engineering
Hosts: Henrik Wann Jensen & Matthias Zwicker
- **Research Intern at INDUSTRIAL LIGHT & MAGIC** SUMMERS OF 2003, 2005, 2006
R&D Group
Host: Florian Kainz
- **Student Researcher at UNIVERSITY OF ILLINOIS, URBANA-CHAMPAIGN** JUNE 2001 – JUNE 2003
Department of Computer Science
Host: John C. Hart

SUPERVISION

- **Post-Docs**
Ralf Habel 2012–PRESENT
Derek Nowrouzezahrai 2010–2011
- **Interns**
Jan Novák SUMMER 2011
Wenzel Jakob 2010 – 2011

Robert Thomas	SUMMER 2010
Marios Papas	SUMMER 2010
Jared M. Johnson	SUMMER 2010
Derek Nowourzezahrai	SUMMER 2009
• Ph.D. Students	
Marios Papas	2011–PRESENT
Christian Regg	2010–PRESENT
• Masters Students	
Jorge Schwarzhaupt (Ongoing)	2011–PRESENT
Marina Späni (Ongoing)	2011–PRESENT
Thomas Houit (Ongoing)	2011–PRESENT
Thomas Siegrist (Ongoing)	2011–PRESENT
Michael Morandi (Ongoing)	2011–PRESENT
Philipp Keller: <i>Manufacturing Layered Attenuators for Multiple Prescribed Shadow Images</i>	2011
Silvan Tschoop: <i>Facial Performance Appearance Capture and Rendering</i>	2011
Stefan Geiger: <i>An Immersive 3D Augmented Reality Lens</i>	2010–2011
Benjamin Müller: <i>Analytic Lighting in the Presence of Participating Media</i>	2010–2011
Pascal Goffin: <i>Fast Ray Tracing of Line Primitives</i>	2009–2010
• Bachelor Students	
Sebastien Millius	2011
Adrian Blumer	2011
• Ph.D. Dissertation Committees	
Adolfo Muñoz (Universidad de Zaragoza): <i>Light Transport in Participating Media</i>	APRIL 2010

TEACHING EXPERIENCE

• Adjunct Lecturer at ETH ZÜRICH	
252-5705-00L: Image Synthesis	SPRING 2012
252-0543-01L: Computer Graphics (with Alex Hornung & Ilya Baran)	FALL 2010
251-0543-01L: Computer Graphics (with Alex Hornung)	FALL 2009
• Teaching Assistant/Lecturer at UC SAN DIEGO	
CSE 168: Rendering Algorithms	SPRING 2005, 2006, 2007, 2008
CSE 169: Computer Animation	WINTER 2006
CSE 167: Introduction to Computer Graphics	FALL 2005

PUBLICATIONS

Peer-Reviewed Journals/Conferences

- [1] I. Baran, P. Keller, D. Bradley, S. Coros, W. Jarosz, D. Nowrouzezahrai, M. Gross. “Manufacturing Layered Attenuators for Multiple Prescribed Shadow Images.” In *Computer Graphics Forum (Proceedings of Eurographics)*, 2012.
- [2] B.J. Loos, D. Nowrouzezahrai, W. Jarosz, P.P. Sloan. “Delta Radiance Transfer.” In *ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games (i3D)*, 2012.
- [3] I. Sadeghi, A. Munoz, P. Laven, W. Jarosz, F. Seron, D. Gutierrez, and H. W. Jensen. “Physically-Based Simulation of Rainbows.” In *ACM Transactions on Graphics*, 2012. *accepted for publication*
- [4] W. Jarosz, D. Nowrouzezahrai, P.P. Sloan, M. Zwicker. “Progressive Photon Beams.” In *ACM Transactions on Graphics (Presented at SIGGRAPH Asia)*, 2011.
- [5] B.J. Loos, L. Antani, K. Mitchell, D. Nowrouzezahrai, W. Jarosz, P.P. Sloan. “Modular Radiance Transfer.” In *ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia)*, 2011.
- [6] D. Nowrouzezahrai, S. Geiger, K. Mitchell, R. Sumner, W. Jarosz and M. Gross. “Light Factorization for Mixed-Frequency Shadows in Augmented Reality.” In *IEEE International Symposium on Mixed and Augmented Reality*, 2011.
- [7] J. van Baar, S. Poulakos, W. Jarosz, D. Nowrouzezahrai, R. Tamstorf and M. Gross. “Perceptually-Based Compensation of Light Pollution in Display Systems.” In *ACM Symposium on Applied Perception in Graphics and Visualization*, 2011.
- [8] D. Nowrouzezahrai, Jared Johnson, Michael Kashcalk, Andrew Selle, Dylan Lacewell, W. Jarosz. “A Programmable System for Artistic Volumetric Effects.” In *ACM Transactions on Graphics (Proceedings of SIGGRAPH)*, 2011.
- [9] W. Jakob, C. Regg, W. Jarosz. “Progressive Expectation–Maximization for Hierarchical Volumetric Photon Mapping.” In *Computer Graphics Forum (Proceedings of EGSR)*, 2011.
- [10] W. Jarosz, D. Nowrouzezahrai, I. Sadeghi, H. W. Jensen. “A Comprehensive Theory of Volumetric Radiance Estimation using Photon Points and Beams.” In *ACM Transactions on Graphics (Presented at SIGGRAPH)*, 2011.
- [11] M. Papas, W. Jarosz, W. Jakob, S. Rusinkiewicz, W. Matusik, T. Weyrich. “Goal-based Caustics.” In *Computer Graphics Forum (Proceedings of Eurographics)*, 2011.

- [12] J. Chen, I. Baran, F. Durand, W. Jarosz. “Real-Time Volumetric Shadows using 1D Min-Max Mipmaps.” In *ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games (i3D)*, 2011.
- [13] T. Hachisuka, W. Jarosz, H. W. Jensen. “A Progressive Error Estimation Framework for Photon Density Estimation.” In *ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia)*, 2010.
- [14] W. Jarosz, N. A. Carr, H. W. Jensen. “Importance Sampling Spherical Harmonics.” In *Computer Graphics Forum (Proceedings of Eurographics)*, 2009.
- [15] T. Hachisuka, W. Jarosz, R. P. Weistroffer, K. Dale, G. Humphreys, M. Zwicker, H. W. Jensen. “Multidimensional Adaptive Sampling and Reconstruction for Ray Tracing.” In *ACM Transactions on Graphics (Proceedings of SIGGRAPH)*, 2008.
- [16] S. Paris, W. Chang, O. Kozhushnyan, W. Jarosz, W. Matusik, M. Zwicker, F. Durand. “Hair Photobooth: Geometric and Photometric Acquisition of Real Hairstyles.” In *ACM Transactions on Graphics (Proceedings of SIGGRAPH)*, 2008.
- [17] W. Jarosz, M. Zwicker, H. W. Jensen. “Irradiance Gradients in the Presence of Participating Media and Occlusions.” In *Computer Graphics Forum (Proceedings of EGSR)*, Vol. 27, No. 4, June 2008.
- [18] W. Jarosz, C. Donner, M. Zwicker, H. W. Jensen. “Radiance Caching for Participating Media.” In *ACM Transactions on Graphics (Presented at SIGGRAPH)*, March 2008.
- [19] W. Jarosz, M. Zwicker, H. W. Jensen. “The Beam Radiance Estimate for Volumetric Photon Mapping.” In *Computer Graphics Forum (Proceedings of Eurographics)*, 2008.
- [20] P. Clarberg, W. Jarosz, T. Möller, H. W. Jensen. “Wavelet Importance Sampling: Efficiently Evaluating Products of Complex Functions.” In *ACM Transactions on Graphics, (Proceedings of SIGGRAPH)*, 2005.
- [21] J. C. Hart, E. Bacht, W. Jarosz, T. Fleury. “Using Particles to Sample and Control More Complex Implicit Surfaces.” In *Proceedings of Shape Modeling International*, 2002.

Refereed Courses/Classes

- [22] Lecturer in “Scattering,” with Diego Gutierrez, Craig Donner, and Henrik Wann Jensen at SIGGRAPH Asia 2009.
- [23] Lecturer in “Scattering,” with Diego Gutierrez, Craig Donner, and Srinivasa Narasimhan at SIGGRAPH 2009.
- [24] Lecturer in “Scattering,” with Diego Gutierrez, Henrik Wann Jensen, and Srinivasa Narasimham at SIGGRAPH Asia 2008.
- [25] Organizer and lecturer in “Advanced Global Illumination using Photon Mapping,” with Henrik Wann Jensen and Craig Donner at SIGGRAPH 2008.

Refereed Sketches & Abstracts

- [26] B.J. Loos, L. Antani, K. Mitchell, D. Nowrouzezahrai, W. Jarosz, P.P. Sloan. “Runtime Implementation of Modular Radiance Transfer.” In *ACM SIGGRAPH 2011 Talks: Speed of Light*, 2011.
- [27] J. Johnson, D. Laceywell, A. Selle, W. Jarosz. “Gaussian Quadrature for Photon Beams in Tangled.” In *ACM SIGGRAPH 2011 Talks: Volumes and Rendering*, 2011.
- [28] T. Hachisuka, W. Jarosz, H. W. Jensen. “An Error Estimation Framework for Photon Density Estimation.” In *ACM SIGGRAPH 2010 Talks: Rendering Intangibles*, 2010.
- [29] W. Jarosz, C. Donner, M. Zwicker, H. W. Jensen. “Radiance Caching for Participating Media.” In *ACM SIGGRAPH Sketches & Applications*, 2007.

Invited Publications

- [30] W. Jarosz, M. Zwicker, J. Schulze. “EvalWare: Virtual Reality and Visualization Resources [Best of the Web].” *Signal Processing Magazine, IEEE*, Vol. 25, No. 4, July 2008.

Patents

- [31] W. Jarosz, N. Carr. “Importance Sampling Spherical Harmonics.” *Patent pending*

MOVIE CREDITS

- *Tangled* - “Research” 2010

HONORS & AWARDS

- **Academy Award for Technical Achievement** JANUARY 2007
Awarded to Florian Kainz for OpenEXR. I worked on the project for two summers and implemented tiered and tiled image support mentioned in the award: “*Widely adopted, OpenEXR is engineered to meet the requirements of the visual effects industry by providing for lossless and lossy compression of tiered and tiled images.*”
- **UCSD CSE 168 Rendering Competition – Grand Prize** SPRING 2004
Won a trip to SIGGRAPH 2004 for rendering a realistic scene of a cluttered desk using a personally-written renderer for CSE 168. See <http://graphics.ucsd.edu/courses/rendering/2004>
- **CRA Outstanding Undergraduate Award – Honorable Mention** 2003

TALKS/INVITED LECTURES

- [32] “*Tangled: Behind the Magic.*” Scientifica¹¹: Zürcher Wissenschaftstage, Disney-Night. August, 27, 2011.
- [33] “The Research Behind the Magic.” UIUC. Computer Science - Distinguished Lecture Series. November, 29, 2010.
- [34] “Non-Photorealistic Rendering.” UCSD. Invited lecture for CSE 168, June 5, 2008.
- [35] “Textures, Environment mapping, and Procedurals.” UCSD. Invited lecture for CSE 168, May 6, 2008.
- [36] “Efficient Light Transport in Scattering Media.” Walt Disney Animation Studios, Los Angeles, February 5, 2008.
- [37] “Efficient Light Transport in Scattering Media.” UCSD. Invited lecture for CSE 272, December 5, 2007.
- [38] “Texturing.” UCSD. Invited lecture for CSE 168, May 8, 2007.
- [39] “Global Illumination.” UCSD. Invited lecture for CSE 168, May 3, 2006.
- [40] “OpenEXR: Towards Realtime Playback.” SIGGRAPH 2005 OpenEXR Birds of a Feather.
- [41] “Non-Photorealistic Rendering.” UCSD. Invited lecture for CSE 168, June 2, 2005.

PROFESSIONAL ACTIVITIES

Committees

- ACM SIGGRAPH Technical Papers Committee 2012
- ACM SIGGRAPH Symposium on Interactive 3D Graphics (i3D) 2012
- Eurographics Symposium on Rendering Paper Committee (EGSR) 2011, 2010
- SIGGRAPH Asia Sketches Committee 2009, 2008

Proceedings/Issues

- Guest co-editor CG&A Special Issue on “Scattering: Acquisition, Modeling, and Rendering” MAY/JUNE 2013

Reviewer

- SIGGRAPH 2011, 2010, 2009, 2008, 2007, 2006, 2005, 2004
- SIGGRAPH Asia 2010, 2009, 2008
- Transactions on Graphics 2011, 2010, 2009
- Eurographics 2011, 2010, 2009, 2008
- Eurographics Symposium on Rendering 2011, 2010, 2009, 2005
- Computer Graphics Forum 2011, 2010, 2009
- The Visual Computer 2010, 2007
- Interactive Ray Tracing 2007

Student Volunteer

- Symposium on Computer Animation 2007

President

- SIGGRAPH, UIUC Student Chapter SUMMER 2001 – SPRING 2002

PRESS & MEDIA COVERAGE

- “Engraved plastic panel casts image in light and shade.” *New Scientist*. March 24, 2011.
- “Hairstyles for games and movies.” Emerging Technology Trends | ZDNet.com. Aug. 16, 2008.
- “Hair Photobooth: Geometric and Photometric Acquisition of Real Hairstyles.” The Composed Gentleman. Aug. 14, 2008.
- “Hollywood hair will be captured at last: details in SIGGRAPH 2008 paper.” EurekaAlert. Aug. 13, 2008.
- “Hollywood Hair is Captured at Last.” PhysOrg. Aug. 13, 2008.
- “Hollywood Hair is Captured at Last: Details in SIGGRAPH 2008 Paper.” Jacobs School News. Aug. 13, 2008.
- “A Better Fog And Smoke Machine From Computer Scientists.” Science Daily. Apr. 20, 2008.
- “A better fog and smoke machine from computer scientists.” Science Blog. Apr. 16, 2008.
- “Light-in-Fog Computer Simulation Is Ultra Realistic and Cheap.” io9. Apr. 17, 2008.
- “Innovative Computer Graphics Machine that Reduce the Computational Cost of Making Realistic Smoky and Foggy 3-D Images Using Ray Tracing Algorithms.” 4Engr.com. Apr. 17, 2008.
- “A better fog and smoke machine from researchers at UC San Diego.” Science Centric. Apr. 17, 2008.
- “Scientists Use Ray-tracing Technology For Advanced Fog and Smoke Graphics Effects.” CdrInfo.com. Apr. 17, 2008.
- “Computer Science Fog Machine Improves Computer Graphics.” PhysOrg. Apr. 16, 2008.
- “A new way to improve computer graphics.” Emerging Technology Trends | ZDNet.com. Apr. 16, 2008.
- “Computer Science Fog Machine Improves Computer Graphics.” ACM TechNews. Apr. 16, 2008.
- “A new way to improve computer graphics.” Roland Piquepaille’s Technology Trends. Apr. 16, 2008.
- “Scientists turn to ray-tracing for advanced graphics effects.” TG Daily. Apr. 16, 2008.
- “Computer Science Fog Machine Improves Computer Graphics.” HPC Wire. Apr. 15, 2008.
- “Computer Science Fog Machine Improves Computer Graphics.” Jacobs School News. Apr. 15, 2008.
- “A better fog and smoke machine from computer scientists at UC San Diego.” EurekaAlert. Apr. 15, 2008.
- “An Easier Way to Simulate a Foggy View.” Photonics Spectra Magazine. October, 2007.
- “Determine the exact kind of milk spilled by computer graphics.” 4Engr.com. Aug. 17, 2007.
- “Render Smoke and Fog Without Being a Computation Hog.” ACM TechNews. Aug. 13, 2007.
- “Seeing Your Smoke and Breathing It Too.” DDJ’s Portal Blog. Aug. 9, 2007.

- “Render smoke and fog without being a computation hog.” EurekaAlert. Aug. 9, 2007.
- “Render Smoke and Fog without being a Computation Hog.” Jacobs School News. Aug. 9, 2007.
- Cover Image for 2005-2006 CSE Departmental Brochure.
- “SIGGRAPH In San Diego: Graphics, Video And Rock.” Jacobs School News. Aug. 4, 2005.
- “Calitz Lights Up SIGGRAPH 2005.” HPC Wire. Aug. 4, 2005.
- “Light Clouds, Camera Arrays and Speedier Rendering at SIGGRAPH 2005.” UCSD News. July 28, 2005.
- “California Institute researchers unveil computer graphics innovations at SIGGRAPH.” EurekaAlert. July 28, 2005
- “Researchers Unveil Computer Graphics Innovations at SIGGRAPH.” Red Orbit. July 28, 2005.

REFERENCES

Available upon request.