

Curriculum Vitae

WINNEMÖLLER, Holger (PhD)

Current Status (2007-present)

Principal Scientist @ Adobe Research
Seattle, Washington, USA.

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Research

Current: Art creation tools for novices: Most adults do not regularly engage in creative expression, such as painting or drawing. Reasons include a perceived lack of imagination, a lack of skills, time constraints, etc. My current research enabled novices to partake in artistic expression through assistance technologies that augment or correct the user's input to improve visual quality, while preserving enough of the input variations to promote a sense of ownership of the resulting artwork.

PhD: Investigating the mutual connections between non-photorealistic imagery and human perception: Using models of low level human vision to meaningfully abstract and simplify images; and using non-photorealistic imagery to determine the effectiveness of directed visual cues on task-based performance.

Previous: HCI; Creativity; Novice users; Assisted artistic expression; Non-photorealistic Rendering; (keywords) Real-time rendering; Image-based rendering; Perceptually-motivated rendering algorithms; Virtual Environments; Non-linear dimensionality reduction (analysis, visualization and synthesis of: video, motion-capture data, and illumination-variant images); Gesture Recognition; Automatic High Dynamic Range Compositing.

Education

2004-2006	-	PhD (completed) at Northwestern University
2002-2004	-	PhD candidate in Computer Science at University of Cape Town
2000-2002	-	Masters of Science in Computer Science at Rhodes University
1998-2000	-	B.Sc. (Hons.) in Computer Science at Rhodes University (with Distinction)
1997-1998	-	B.Sc. in Physics and Computer Science at Rhodes University (with Distinction)
1995-1996	-	Physics and Computer Science at Hamburg University
1994, 1995	-	Linguistics and Language, History & Culture of America at Hamburg University

Publications

- Jun Xie, Holger Winnemöller, Wilmot Li, Stephen Schiller: *Interactive Vectorization*. CHI 2017: TBD.
- James W. Hennessey, Han Liu, Holger Winnemöller, Mira Dontcheva, Niloy J. Mitra: *How2Sketch: Generating Easy-to-follow Tutorials for Sketching 3D Objects*. I3D 2017: 8
- C. Ailie Fraser, Mira Dontcheva, Holger Winnemöller, Sheryl Ehrlich, Scott R. Klemmer: *DiscoverySpace: Suggesting Actions in Complex Software*. Conference on Designing Interactive Systems 2016: 1221-1232
- C. Ailie Fraser, Mira Dontcheva, Holger Winnemöller, Scott R. Klemmer: *DiscoverySpace: Crowdsourced Suggestions Onboard Novices in Complex Software*. CSCW Companion 2016: 29-32
- Sergey Karayev, Matthew Trentacoste, Helen Han, Aseem Agarwala, Trevor Darrell, Aaron Hertzmann, Holger Winnemöller: *Recognizing Image Style*. BMVC 2014
- Yongjin Kim, Holger Winnemöller, Seungyong Lee: *WYSIWYG Stereo Painting with Usability Enhancements*. IEEE Trans. Vis. Comput. Graph. 20(7): 957-969 (2014)
- Jun Xie, Aaron Hertzmann, Wilmot Li, Holger Winnemöller: *PortraitSketch: Face Sketching Assistance for Novices*. UIST 2014: 407-417
- Luca Benedetti, Holger Winnemöller, Massimiliano Corsini, Roberto Scopigno: *Painting with Bob: Assisted Creativity for Novices*. UIST 2014: 419-428
- Alexandrina Orzan, Adrien Bousseau, Pascal Barla, Holger Winnemöller, Joëlle Thollot, David Salesin: *Diffusion curves: a vector representation for smooth-shaded images*. Commun. ACM 56(7): 101-108 (2013)
- Nicholas M. Davis, Holger Winnemöller, Mira Dontcheva, Ellen Yi-Luen Do: *Toward a cognitive theory of creativity support*. Creativity & Cognition 2013: 13-22
- Yongjin Kim, Holger Winnemöller, Seungyong Lee: *WYSIWYG Stereo Painting*. I3D 2013: 169-176
- Holger Winnemöller: *NPR in the Wild*. Image and Video-Based Artistic Stylisation 2013: 353-374
- Sergey Karayev, Aaron Hertzmann, Holger Winnemöller, Aseem Agarwala, Trevor Darrell: *Recognizing Image Style*. CoRR abs/1311.3715 (2013)
- Holger Winnemöller, Jan Eric Kyprianidis, Sven C. Olsen: *XDoG: An eXtended difference-of-Gaussians compendium including advanced image stylization*. Computers & Graphics 36(6): 740-753 (2012)
- Holger Winnemöller: *XDoG: Advanced image stylization with eXtended Difference-of-Gaussians*. NPAR 2011: 147-156
- Adrian Secord, Holger Winnemöller, Wilmot Li, Mira Dontcheva: *Creating collections with automatic suggestions and example-based refinement*. UIST 2010: 249-258
- Holger Winnemöller, Alexandrina Orzan, Laurence Boissieux, Joëlle Thollot: *Texture Design and Draping in 2D Images*. Comput. Graph. Forum 28(4): 1091-1099 (2009)
- Elmar Eisemann, Holger Winnemöller, John C. Hart, David Salesin: *Stylized Vector Art from 3D Models with Region Support*. Comput. Graph. Forum 27(4): 1199-1207 (2008)

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- Alexandrina Orzan, Adrien Bousseau, Holger Winnemöller, Pascal Barla, Joëlle Thollot, David Salesin: *Diffusion curves: a vector representation for smooth-shaded images*. ACM Trans. Graph. 27(3) (2008)
- Holger Winnemöller, David Feng, Bruce Gooch, Satoru Suzuki: *Using NPR to evaluate perceptual shape cues in dynamic environments*. NPAR 2007: 85-92
- Holger Winnemöller: *Perceptually-motivated Non-Photorealistic Graphics*. PhD Dissertation, Northwestern University, USA, (2006).
- Holger Winnemöller, Sven C. Olsen, Bruce Gooch: *Real-time video abstraction*. ACM Trans. Graph. 25(3): 1221-1226 (2006)
- Holger Winnemöller, Ankit Mohan, Jack Tumblin, Bruce Gooch: *Light Waving: Estimating Light Positions From Photographs Alone*. Comput. Graph. Forum 24(3): 433-438 (2005)
- Holger Winnemöller, Shaun Bangay: *Rendering Optimisations for Stylised Sketching*. Afrigraph 2003: 117-122
- Holger Winnemöller, Shaun Bangay: *Geometric Approximations Towards Free Specular Comic Shading*. Comput. Graph. Forum 21(3): 309-316 (2002)
- Holger Winnemöller: *Implementing Non-photorealistic Rendering Enhancements with Real-Time Performance*. Master's thesis, Rhodes University, South Africa, (2002).
- Holger Winnemöller, Shaun Bangay: *Super-realistic Rendering using Real-time Tweening*. In SATNAC 2001 (September 2001), South African Telecommunication Networks & Applications Conference.
- Holger Winnemöller: *Practical Gesture Recognition for controlling Virtual Environments*. Honours Thesis, Rhodes University, (1999).

Reviewing and Committee duties

SIGGRAPH, SIGGRAPH Asia, TOG, UIST, NPAR, CAe, Eurographics, EGSR, TVCG, CG&A.

Issued Patents

- #9495581, *Providing Drawing Assistance using Feature Detection and Semantic Labeling*, August 6, 2015.
- #9305382, *Geometrically and parametrically modifying user input to assist drawing*, April 5, 2016.
- #9202309, *Methods and apparatus for digital stereo drawing*, December 1, 2015.
- #8896622, *Methods and apparatus for marker-based stylistic rendering*, November 25, 2014.
- #8787698, *Methods and apparatus for directional texture generation using image warping*, July 22, 2014.
- #8669995, *Methods and apparatus for stroke grouping for high-level sketch editing*, March 11, 2014.
- #8614708, *System and method for scalable rendering of diffusion curves*, December 24, 2013.
- #8612882, *Method and apparatus for creating collections using automatic suggestions*, December 17, 2013.
- #8532387, *Methods and apparatus for procedural directional texture generation*, September 10, 2013.
- #8514238, *System and method for adding vector textures to vector graphics images*, August 20, 2013.
- #8452116, *Estimating sensor sensitivity*, May 28, 2013.
- #8391618, *Semantic image classification and search*, March 5, 2013.
- #8249365, *M&A for directional texture generation using sample-based texture synthesis*, August 21, 2012.

Apps

PaintCan	2015-present	<i>Assisted painting from photographs</i> : Complete app architecture, design, implementation, marketing, etc.
Adobe Capture CC	2015-present	<i>Capturing of assets for use in CC</i> : Edge detection & stylization technology.
StoryMe	2013-2014	<i>Comic strip creator</i> : Stylization technology.
ToonPAINT	2010-2011	<i>Cartoon effect and finger-paint coloring</i> : Complete app architecture, design, implementation, marketing, etc.

Awards

Year	Prizes & Scholarships	Academic Colours
2004	- UCT Travel Scholarship	n.a.
2000	- Rhodes University Postgraduate Scholarship - Master's Degree Scholarship	n.a.
1999	- Henry Bradlow Scholarship for Science - Rhodes University Postgraduate Scholarship - Master's Degree Scholarship	Honours
1998	- Alexander Ogg Prize for Physics - Dr. Kendall Scholarship	Colours
1997	- A Trevor Williams' Prize for Physics II	Half-Colours

Teaching and Work Experiences

2006-2011	- Founder and Lead Development of ToonFX, LLC.
2002-2004	- Freelance Software Development
2003	- Senior Tutor for Introduction to Programming (Java)
2002	- Teaching Assistant for Introduction to Programming (Java) - Lecturer for first year Java Modules (GUI programming & 2D Graphics in Java)
1998-2002	- Tutoring for third year Computer Science at Rhodes University. - Special tutoring for first year Computer Science course. - Practical tutoring for first year Physics.
1995	- Installation and maintenance of Computer equipment as well as programming for civil engineering project in Mbabane, Swaziland.
1995	- Internship at a Hamburg newspaper.
1993-1994	- Civilian Service in Germany for the "Deutsche Muskelschwund Hilfe"
1990	- Internship at the "Deutsche Schiffbau-Versuchsanstalt" (German Experimental Ship-building Institute)

Natural Language Skills

	<i>German</i>	<i>English</i>	<i>French</i>
Written	Fluent – Mother tongue	Fluent	Semi-Fluent
Verbal	Fluent – Mother tongue	Fluent	Semi-Fluent

Computer Language Skills

(in order of most common usage first)

C++, C, C#, Objective-C, Lua, OpenGL ES, Java, JavaScript, Python, PHP, Perl, Assembler.

Technical Skills

Operating Systems: MacOS, Windows, iOS, Android, Linux.

Technologies: Mobile, GPU, GPGPU, Machine Learning, OpenGL, OpenCV, CG, HTML, CSS.

Applications: Adobe Photoshop, Adobe Premiere, CorelDraw, 3D Studio Max, .

Non-Academic Qualifications

2000 - NAUI Scuba Diver
1995 - Professional Fitness Instructor
1994, 1996 - First Aid

Personal Interests

Computers, Sports (Volleyball, Weight-Training, Fitness, Squash, Diving, Basketball, Ultimate Frisbee, Rollerblading), Drawing, Reading, Videography, Music.