

CURRICULUM VITAE

MARC OLANO

Associate Professor
Computer Science and Electrical Engineering
University of Maryland, Baltimore County
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Baltimore, MD 21250

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EDUCATION

Ph.D.	1998	University of North Carolina, Computer Science Dissertation: <i>A Shading Language on Graphics Hardware</i> (Advisor: Anselmo Lastra)
B.S.	1990	University of Illinois, Electrical Engineering

EXPERIENCE IN HIGHER EDUCATION

2008–present	University of Maryland, Baltimore County, Associate Professor, Computer Science and Electrical Engineering
2002–2008	University of Maryland, Baltimore County, Assistant Professor, Computer Science and Electrical Engineering
2000	Stanford University, Adjunct Assistant Professor, Computer Science

EXPERIENCE IN OTHER THAN HIGHER EDUCATION

2006–present	NIST, Faculty Appointee, Scientific Applications and Visualization Group
2011	Activision, Visiting Faculty
2009–2010	Firaxis Games, Visiting Faculty
1998–2002	SGI, Member of Technical Staff / Technical Lead, OpenGL Shader
1988–1991	Eastman Kodak Company, Research Programmer, Visualization
1987–1988	Rhino Robotics, Inc, Programmer, CNC Lathe Simulator

HONORS RECEIVED

2009	DOE OASCR visualization award, W.L. George, N.S. Martys, S.G. Satterfield, J. Hagedorn, M. Olano and J. Terris, <i>Simulation of Non-Newtonian Suspensions: Shear Thinning Case</i> , SciDAC 2009 Electronic Visualizations and Posters
2008	DOE OASCR visualization award, W.L. George, N.S. Martys, J. Lancien, S.G. Satterfield, M. Olano, E. Garboczi and J. Terrill, <i>Simulation of a Dense Suspension with Interactive Controls</i> , SciDAC 2008 Electronic Visualizations and Posters.
2006–2008	Invited Expert, Khronos Group, OpenGL Steering Group
2003	Invited to write foreword for Randi Rost, <i>OpenGL Shading Language</i> , Addison-Wesley, 2004.

RESEARCH SUPPORT AND FELLOWSHIPS

Funded

2011 – 2012	<i>Teaching Information Assurance Concepts to High School Students Through a New Social Media Game</i> (\$85,463, DoD IASP, Co-PI)
2009 – 2011	<i>Video Processor for Panoramic Head-Mounted Display, Phase II</i> (\$68,879, Maryland Industrial Partnerships / Sensics, PI)
2008 – 2011	<i>MRI: Acquisition of an Interdisciplinary Facility for High-Performance Computing</i> (\$200,000, NSF, Co-PI)
2009	<i>GPU Hybrid Rendering</i> (\$3500 Equipment Donation, NVIDIA Professor Partnership, PI)
2008 – 2009	<i>Video Processor for Panoramic Head-Mounted Display</i> (\$70,069, Maryland Industrial Partnerships / Sensics, PI)
2007 – 2008	<i>UMBC XNA GAIM Laboratory</i> (\$20,000 + \$10,000 UMBC match, Microsoft XNA Lab, PI)
2007	<i>UMBC Cell-Processor Virtual Computing Laboratory</i> (amount confidential, IBM VCL, Co-PI)
2006	<i>Websphere S/W Applications for Service Oriented Science, Engineering and Multi Core Cell Data Intensive Visualization</i> (\$72,133, IBM SUR, Co-PI)
2002–2008	Equipment donations, (\$3,000, ATI/AMD)
2005	<i>Programmable Layered Architecture with Artistic Rendering</i> (\$18,720, NIH, Lister Hill National Center for Biomedical Communications at the National Library of Medicine, Medical Informatics Visiting Faculty Fellowship).
2003–2004	<i>Visualization API Enablers for a High-End Fine-Grained Parallel Processor</i> (\$83,048, NSF STTR / XMTT Inc., Co-PI)
2002–2003	<i>Automatic Simplification of Procedural Shaders</i> (\$16,000, UMBC DRIF, PI)
2003	<i>Programmable Layered Architecture with Artistic Rendering</i> (\$20,000, NIH, Lister Hill National Center for Biomedical Communications at the National Library of Medicine, Medical Informatics Visiting Faculty Fellowship)

Pending

2012–2015	<i>ABI Development: Ecosynth: An Advanced Open-Source 3D Toolkit for Forest Ecology</i> (\$878,565, NSF, Co-PI)
2012–2013	<i>Forest Canopy Scanning with an RC Helicopter-mounted Tegra</i> (\$25,000, NVIDIA, PI)
2012	<i>UMBC CUDA Teaching Center</i> (\$5,500, NVIDIA, PI)
2011–2014	<i>MRI: Acquisition of an Expansion of the Interdisciplinary UMBC High Performance Computing Facility</i> (\$556,780, NSF, Co-PI)

PH.D. STUDENTS

Kishalay Kundu	prelim 10/27/2006	chair
<i>An Extensible Surgery Simulation Framework Supporting Cuts</i>		
Mark Bolstad	prelim 10/15/2007	chair
<i>Rendering Massive Models</i>		
Wesley Griffin	pre-prelim	chair
Yu Wang	pre-prelim	chair
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Eleanor Chlan-Boyle	2005	committee member
<i>A Botanically Inspired Information Visualization of Hierarchical Data Sets</i>		
Alark Joshi	2007	committee member
<i>Effective Visualization of Time-varying Data Using Cognition-based Principles</i>		
Philippe Robert	2007	committee member
<i>Real-Time Rendering on a Stream Architecture using Hybrid Scalability Techniques</i>		
University of Bern, Switzerland		
Jesus Caban	2009	committee member
<i>Generation and Visualization of Hierarchical Statistical Volumes</i>		
Christopher Morris	prelim 1/26/2007	committee member
<i>A Non-Photorealistic Rendering Framework for Integrating Separate Graphics Streams</i>		
David Trimm	prelim 7/30/2007	committee member
<i>Analyzing Path Populations and Associated Data Through Automation, Visualization and Interaction</i>		
Dana Wortman	prelim 6/9/2008	committee member
<i>Visualizing Sequential Patterns in Large Datasets Using Levels of Abstraction</i>		
Jonathan Dandois	prelim 5/3/2011	committee member
<i>Remote sensing of vegetation structure and composition using computer vision</i>		

MASTER'S STUDENTS

Daniel Hood	2003	MS project chair
<i>Analogy Based Segmentation of Volumetric Data</i>		
Joshua Barczak	2005	MS thesis chair
<i>Interactive Illumination Using Large Sets of Point Lights</i>		
Aimee Joshua	2005	MS thesis chair
<i>Modeling and Rendering of Mold on Cut Wood</i>		
Hanli Ni	2005	MS thesis chair
<i>Hybrid 3D-model Representation Through Quadric Metrics and Hardware Accelerated Point-based Rendering</i>		
Yi Wang	2005	MS thesis chair
<i>GPU Based Cloth Simulation on Moving Avatars</i>		
Pat Gillespie	2006	MS thesis chair
<i>Perceptually Oriented Patch Based Texture Synthesis</i>		
Kristian Kuhn	2006	MS project chair
<i>Using RTP and RTSP for Real-time 3D Interaction</i>		

Jonathan Decker	2007	MS thesis chair
<i>System of Bound Particles for Interactive Flow Visualization</i>		
Stephen Ingram	2007	MS thesis co-chair with Tamara Munzner
<i>Glimmer: Multilevel MDS on the GPU</i> (University of British Columbia, Canada)		
Jeremy Shopf	2007	MS thesis chair
<i>Interactive Rendering of Heterogeneous Translucent Objects</i>		
John Kloetzli	2008	MS thesis chair
<i>Real-Time High Quality Volume Isosurface Rendering</i>		
Pankaj Chaudhari	2008	MS thesis chair
<i>Real-Time Multiple Refractions through Deformable Objects</i>		
Aaron Curtis	2009	MS thesis chair
<i>Real-Time Soft Shadows on the GPU via Monte-Carlo Sampling</i>		
Brian Strege	2009	MS project chair
<i>Using Tiled Head-Mounted Displays with a Single Video Source</i>		
Sean Dukehart	2009	MS thesis chair
<i>GPU Random Walkers for Image Segmentation</i>		
Wesley Griffin	2010	MS thesis chair
<i>Real-Time GPU Surface Curvature Estimation</i>		
Fahad Zafar	2010	MS thesis chair
<i>Tiny Encryption Algorithm for Cryptographic Gradient Noise</i>		
Yu Wang	2011	MS thesis chair
<i>A Framework for GPU 3D Model Reconstruction Using Structure-from-Motion</i>		
Elizabeth Baumel	in progress	MS thesis chair
Preeti Bindu	in progress	MS thesis chair
Ravikiran Dighade	in progress	MS thesis chair
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Namita Parab	2003	MS thesis committee
<i>Refining Implicit Models</i>		
Jay Patel	2003	MS project committee
<i>Multivariate Data Visualization of Gait Ataxia</i>		
Utkarsch Ayachit	2004	MS thesis committee
<i>Flow Visualization: A Level-of-detail Approach</i>		
Srinivas Bhagavatula	2004	MS thesis committee
<i>Exploring the Volume Illustration Parameter Space</i>		
Poonam Shanbhag	2004	MS thesis committee
<i>Temporal Visualization of Planning Polygons for Efficient Partitioning of Geo-spatial Data</i>		
Simone Thomas	2005	MS thesis committee
<i>Morphing Materials: Capturing Tangible Material Properties in Pen-and-Ink Style Rendering</i>		
Mithila Patwardhan	2006	MS thesis committee
<i>Motion-based Visualization for Deep Exploration of Relational, Spatio-temporal Data</i>		

Bryan Pass	2007	MS project committee
<i>A Virtual Security Coprocessor Design Using Hardware VMM Instructions</i>		
Jason Pearlman	2007	MS thesis committee
<i>Visualizing Network Security Events Using Compound Glyphs from a Service-Oriented Perspective</i>		
Alex Feldman	2008	MS thesis committee
<i>Swarm Robotics: Parallelized Line Formation</i>		
Jonathan Bronson	2008	MS thesis committee
<i>Statistically Weighted Visualization Hierarchies</i>		
Ryan Bergeron	2008	MS thesis committee
<i>Visualizing Team Performance Dynamics</i>		

UNDERGRADUATE STUDENTS

Joshua Barczak	2002	Independent study advisor
<i>Ray Tracing Using Programmable Fragment Shading Hardware</i> (published in <i>UMBC Review</i>)		
John Kloetzli	2005	Honors thesis advisor
<i>Interactive Fur Rendering</i>		
Tim Murray	2005	Independent study advisor
<i>Source Code Visualization</i>		
Bryan Pass	2005	Independent study advisor
<i>Distributed Collision Detection</i>		
Paul Oliver	2008	Independent study advisor
<i>Graphical Design of Programmable Shaders</i>		
Wallace Brown	2010	Independent study advisor
<i>Cloth rendering</i>		
Brendan Farrington	2010	Independent study advisor
<i>GPU path finding</i>		

PUBLICATIONS

Peer Reviewed Works

Books and Edited Proceedings

Marc Olano and Philipp Slusallek (editors), *Proceedings of Graphics Hardware 2006: The 21st ACM / Eurographics Symposium on Graphics Hardware* (Vienna, Austria, September 3–4, 2006). ACM Press 2006. 126 pages.

Carlo Séquin and Marc Olano (editors), *Proceedings of I3D 2006: The 10th ACM Symposium on Interactive 3D Graphics and Games* (Redwood City, CA, March 14–17, 2006). ACM Press 2006. 216 pages.

Marc Olano, John Hart, Wolfgang Heidrich, Michael McCool, *Real-time Shading*. AK Peters, 2002. 368 pages.

Edited Juried Course Notes

Marc Olano (editor), David Blythe, Larry Gritz, Mark Kilgard, Michael McCool, Fabio Pellacini and Thorsten Scheuermann. "GPU Shading and Rendering: Course 3." ACM SIGGRAPH 2006 Courses, Proceedings of the International Conference on Computer Graphics and Interactive Techniques, ACM, July 2006. 285 pages.

Marc Olano (editor), Avi Bleiweiss, Larry Gritz, John C. Hart, Mark Kilgard, Michael McCool and Pedro Sander. "GPU Shading and Rendering: Course 37." ACM SIGGRAPH 2005 Courses, Proceedings of the International Conference on Computer Graphics and Interactive Techniques, ACM, July 2005. 283 pages.

Marc Olano (editor), Kurt Akeley, John C. Hart, Wolfgang Heidrich, Micheal McCool, Jason L. Mitchell and Randi Rost. "Real-Time Shading: Course 1." ACM SIGGRAPH 2004 Courses, Proceedings of the International Conference on Computer Graphics and Interactive Techniques, ACM, August 2004. 226 pages.

Marc Olano (editor), Kurt Akeley, John C. Hart, Wolfgang Heidrich, Bill Mark, Jason L. Mitchell and Randi Rost. "Real-Time Shading: Course 7." ACM SIGGRAPH 2003 Courses, Proceedings of the International Conference on Computer Graphics and Interactive Techniques, ACM, July 2003. 243 pages.

Marc Olano (editor), Chas Boyd, Bill Mark, Michael McCool, Jason L. Mitchell and Randi Rost. "State of the Art in Hardware Shading: Course 17." ACM SIGGRAPH 2002 Courses, Proceedings of the International Conference on Computer Graphics and Interactive Techniques, ACM, July 2002. 502 pages.

Marc Olano (editor), John C. Hart, Wolfgang Heidrich, Bill Mark and Ken Perlin. "Real-Time Shading Languages: Course 36." ACM SIGGRAPH 2002 Courses, Proceedings of the International Conference on Computer Graphics and Interactive Techniques, ACM, July 2002. 379 pages.

Marc Olano (editor), John C. Hart, Wolfgang Heidrich, Erik Lindholm, Bill Mark, Michael McCool and Ken Perlin. "Real-Time Shading: Course 24." ACM SIGGRAPH 2001 Courses, Proceedings of the International Conference on Computer Graphics and Interactive Techniques, ACM, August 2001. 353 pages.

Marc Olano (editor), John C. Hart, Wolfgang Heidrich, Michael McCool, Bill Mark, Kekoa Proudfoot. "Approaches to Procedural Shading on Graphics Hardware: Course 27." ACM SIGGRAPH 2000 Courses, Proceedings of the International Conference on Computer Graphics and Interactive Techniques, ACM, July 2000. 139 pages.

Patents

Marc Olano and Mark Peercy, "Method and System for Executing SIMD Instructions using Graphics Technology," US6943798 granted September 2005.

Marc Olano and Mark Peercy, "Method and System for Accelerating Noise," US6747660 granted June 2004.

Marc Olano, "Method, System, and Computer Program Product for Implementing Derivative Operators with Graphics Hardware," US6717599 granted April 2004.

Mark Peercy, Marc Olano and John Airey, "Method and System for Implementing Graphics Control Constructs," US6707462 granted March 2004.

Brian Kieth Cabral, Marc Olano and Philip Nemeč, "Reflection Space Image Based Rendering," US6697062 granted February 2004.

Marc Olano, "System, Method, and Computer Program Product for Real-time Shading of Computer Generated Images," US6657624 granted June 2003; WO03060638 granted July 2003.

Richard Ellson, Lawrence Ray and Marc Olano for Eastman Kodak Company, "Method and Apparatus for Performing Real-Time Computer Animation," US5455902 granted October 1995.

SIGGRAPH Publications

(ACM SIGGRAPH became a regular issue of ACM Transactions on Graphics in 2003)

Mark Peercy, Marc Olano, John Airey and P. Jeffery Ungar, "Interactive Multi-Pass Programmable Shading," Proceedings of ACM SIGGRAPH 2000 (New Orleans, Louisiana, July 23-28, 2000). In *Computer Graphics Proceedings, Annual Conference Series, 2000*. pp. 425–432 (acceptance rate: 19.4%).

Brian Cabral, Marc Olano and Philip Nemeč, "Reflection Space Image Based Rendering," Proceedings of ACM SIGGRAPH 99 (Los Angeles, California, August 8-13, 1999). In *Computer Graphics Proceedings, Annual Conference Series, 1999*. pp. 165–170 (acceptance rate: 16.3%).

Marc Olano and Anselmo Lastra, "A Shading Language on Graphics Hardware: The PixelFlow Shading System," Proceedings of ACM SIGGRAPH 98 (Orlando, Florida, July 19-24, 1998). In *Computer Graphics Proceedings, Annual Conference Series, 1998*. pp. 159–168 (acceptance rate: 14.9%).

Jon Cohen, Marc Olano and Dinesh Manocha, "Appearance Preserving Simplification," Proceedings of ACM SIGGRAPH 98 (Orlando, Florida, July 19-24, 1998). In *Computer Graphics Proceedings, Annual Conference Series, 1998*. pp. 115–122 (acceptance rate: 14.9%).

Journal Articles and Book Chapters

Marc Olano, Dan Baker, *Wesley Griffin* and Joshua Barczak, "Variable bit rate GPU Texture Decompression," *Computer Graphics Forum* vol 30(4) (Proceedings of EGSR 2011). pp. 1299–1308.

Stephan Ingram, Tamara Munzner and Marc Olano, "Glimmer: Multilevel MDS on the GPU," *IEEE Transactions on Visualization and Computer Graphics*. vol 15(2). March-April 2009. pp. 249–261.

James S. Sims, William L. George, Tere Griffin, John G. Hagedorn, Howard K. Hung, John T. Kelso, Marc Olano, Adele P. Peskin, Steven G. Satterfield, Judith Devaney Terrill, Garnett W. Bryant and Jose G. Diaz, "Accelerating Scientific Discovery through Computation and Visualization III. Tight-binding Wave Functions for Quantum Dots," *Journal of Research of the National Institute of Standards*. vol 113(3). May-June 2008. (*cover image*).

Judith Terrill, William George, Terence Griffin, John Hagedorn, John Kelso, Marc Olano, Adele Peskin, Steve Saterfield, James Simms, Jeffery Bullard, Joy Dunkers and Nicos Martyrs, "Extending Measurement Science to Interactive Visualization Environments," Book Chapter, *Trends in Interactive Visualization*, Elena Zudilova-Seinstra, Tony Adriaansen and Robert van Liere, Editors, Springer, 2009.

Jonathan Cohen, Dinesh Manocha and Marc Olano, "Successive Mappings: An Approach to Polygonal Mesh Simplification with Guaranteed Error Bounds," *International Journal of Computational Geometry & Applications*. vol. 13(1). February 2003. pp. 61–94.

Conference Proceedings (full paper refereed)

Wesley Griffin, Yu Wang, David Berrios and Marc Olano, "GPU curvature estimation on deformable meshes," Proceedings of I3D 2011: The 15th ACM SIGGRAPH Symposium on Interactive 3D Graphics and Game (San Francisco, CA, February 18-20, 2011). pp. 159-166 (acceptance rate: 37.5%)

Fahad Zafar, Aaron Curtis and Marc Olano, "GPU Random Numbers via the Thin Encryption Algorithm," Proceedings of HPG 2010: The 2nd ACM SIGGRAPH/Eurographics Symposium on High Performance Graphics (Saarbrücken, Germany, June 25-27, 2010). pp. 133-142 (acceptance rate: 31.7%).

Marc Olano and Dan Baker, "LEAN Mapping," Proceedings of I3D 2010: The 14th ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games (Washington, DC, February 19-21, 2010). pp. 181-188 (acceptance rate: 32.4%).

Tom DuBois, Bryant Lee, Yi Wang, Marc Olano and Uzi Vishkin, "XMT-GPU: A PRAM Architecture for Graphics Computation," Proceedings of ICCP-08: the 37th IACC International Conference on Parallel Processing (Portland, Oregon, September 8-12, 2008). pp. 364-372 (acceptance rate: 30.8%).

Jonathan Bronson, Penny Rheingans and Marc Olano, "Semi-automatic Stencil Creation through Constrained Error Minimization," Proceedings of NPAR 2008: the 6th ACM SIGGRAPH Symposium on Non-Photorealistic Animation and Rendering (Annecy, France, June 9-11, 2008). pp. 31-38 + back cover image (acceptance rate: 40.7%).

John Kloetzli, Brian Strege, Johnathan Decker and Marc Olano, "Parallel Longest Common Subsequence using Graphics Hardware," Proceedings of EGPGV 2008: the 8th Eurographics Symposium on Parallel Graphics and Visualization (Crete, Greece, April 14-15, 2008). pp. 57-64 (acceptance rate: 55.7%).

John Kloetzli, Marc Olano and Penny Rheingans, "Interactive Volume Isosurface Rendering using BT Volumes," Proceedings of I3D 2008: the 12th ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games (Redwood City, CA, February 15-17, 2008). pp. 45-52 (acceptance rate: 42.1%).

Jeremy Shopf and Marc Olano, "Procedural Haptic Texture," Proceedings of UIST 2006: the 19th ACM Symposium on User Interface Software and Technology (Montreaux, Switzerland, October 2006). pp. 179-186 (acceptance rate: 23.0%).

Marc Olano, "Modified Noise for Evaluation on Graphics Hardware," Proceedings of Graphics Hardware 2005: the 20th ACM/Eurographics Symposium on Graphics Hardware (Los Angeles, CA, July 2005). pp. 105-110 (acceptance rate: 39.3%).

Marc Olano, Bob Kuehne and Maryann Simmons, "Automatic Shader Level of Detail," Proceedings of Graphics Hardware 2003: the 18th ACM/Eurographics Symposium on Graphics Hardware (Los Angeles, CA, July 2003). pp. 7-14 (acceptance rate: 33.3%)

Marc Olano, Shrijeet Mukherjee and Angus Dorbie, "Vertex-based Anisotropic Texturing," Proceedings of Graphics Hardware 2001: the 16th ACM/Eurographics Symposium on Graphics Hardware (Los Angeles, CA, August 12-13, 2001). pp. 95-98 + back cover image (acceptance rate: 48.3%).

Marc Olano and Trey Greer, "Triangle Scan Conversion Using 2D Homogeneous Coordinates," Proceedings of Graphics Hardware 1997: the 10th ACM/Eurographics Workshop on Graphics Hardware (Los Angeles, CA, August 2-4, 1997). pp. 89-95.

Jon Cohen, Dinesh Manocha and *Marc Olano*, "Simplifying Polygonal Models using Successive Mappings," Proceedings of IEEE Visualization '97: the 8th conference on Visualization (Phoenix, AZ, October 18-24, 1997). pp. 395–404 (acceptance rate: 25.9%).

Anselmo Lastra, Steve Molnar, *Marc Olano* and *Yulan Wang*, "Real-Time Programmable Shading," Proceedings of I3D 1995: the 4th ACM Symposium on Interactive 3D Graphics (Monterey, CA, April 9-12, 1995). pp. 59–67 (acceptance rate: 34.4%).

Marc Olano, *Jon Cohen*, *Mark Mine* and Gary Bishop, "Combating Rendering Latency," Proceedings of I3D 1995: the 4th ACM Symposium on Interactive 3D Graphics (Monterey, CA, April 9-12, 1995). pp. 19–24 (acceptance rate: 34.4%).

Other Articles

Joshua Barczak, Advisor: *Marc Olano*, "Ray Tracing Using Programmable Fragment Shading Hardware," UMBC Review, 2004, pp. 76–97.

Conference Proceedings (abstract refereed)

Kishalay Kundu and *Marc Olano*, "Tissue Resection Using Delayed Updates in a Tetrahedral Mesh," *MMVR15: Medicine Meets Virtual Reality* (Long Beach, CA, February 6-9, 2007).

Jeff Butterworth, *Andrew Davidson*, *Stephen Hensch* and *Marc Olano*, "3DM: A Three Dimensional Modeler Using a Head-Mounted Display," Proceedings of I3D 1992: the 3rd ACM Symposium on Interactive 3D Graphics (Cambridge, MA, March 29 - April 1, 1992). pp. 135–138 (acceptance rate 43.5%).

Non-Peer-Reviewed Works

Stephen Ingram, Tamara Munzner and *Marc Olano*, "Glimmer: Multilevel MDS on the GPU," *UBC CS TR-2007-15*, Department of Computer Science, University of British Columbia, Vancouver, Canada, 2007. 8 pages.

Josh Barczak and *Marc Olano*, "Interactive Shadowed Caustics Using Hierarchical Light Volumes," *UMBC Department of Computer Science and Electrical Engineering Technical Report*, 2005. 8 pages.

Marc Olano, Invited foreword for *Randi Rost*, *OpenGL Shading Language*, Addison-Wesley, 2004.

Marc Olano and *Bob Kuehne*, "SGI OpenGL Shader™ Level-of-Detail White Paper," *SGI Document 007-4555-001*, SGI, 2002. 22 pages.

Olano, Marc and *Michael North*, "Normal Distribution Mapping," *UNC Computer Science Technical Report 97-041*, 1997. 7 pages.

Marc Olano, *Anselmo Lastra* and *Jon Leech*, "Procedural Primitives in a High Performance, Hardware Accelerated, Z-Buffer Renderer," *UNC Computer Science Technical Report 97-040*, 1997. 10 pages.

Jon Cohen, Dinesh Manocha and *Marc Olano*, "Simplifying Polygonal Models using Successive Mappings," *UNC Computer Science Technical Report 97-011*, 1997. 19 pages.

Jon Cohen and *Marc Olano*, "Low Latency Rendering on Pixel-Planes 5," *UNC Computer Science Technical Report 94-028*, 1994. 24 pages.

Terry S. Yoo and *T. Marc Olano*, "Instant Hole (Windows onto Reality)," *UNC Computer Science Technical Report 93-027*, 1993. 13 pages.

Marc Olano and Terry S. Yoo, "Precision Normals (Beyond Phong)," *UNC Computer Science Technical Report* 93-021, 1993. 4 pages.

Richard Ellson and T. Marc Olano, "Injection Molding: Supercomputing and Supergraphics," *Cray Channels*, v11n3, Fall 1989, Cray Research, 1989. pp. 2–5.

Works Submitted or In Preparation

Journal Articles and Book Chapters

John Kloetzli, Marc Olano and Penny Rheingans, "Direct Ray Tracing of Reconstructed Volumes," *ACM Transactions on Graphics*. (*In Preparation*)

Patrick Gillespie and Marc Olano, "Perceptually-oriented Patch-based Texture Synthesis," *ACM Transactions on Applied Perception*. (*In Preparation*)

Marc Olano, Bradley C. Lowekamp, Dave Chen, Penny Rheingans, Haixa Du, and Terry Yoo, "A Programmable Layered Architecture With Artistic Rendering," *IEEE Transactions on Graphics*. (*In Preparation*)

Jeremy Shopf and Marc Olano, "Interactive Rendering of Heterogeneous Translucent Objects," *Computer Graphics Forum*. (*In Preparation*)

Jeremy Shopf and Marc Olano, "Procedural Haptics for Surgical Simulation," *Surgical Innovation*. (*In Preparation*)

PRESENTATIONS

Conference Papers (Juried/Refereed)

"Modified Noise for Evaluation on Graphics Hardware," *Proceedings of Graphics Hardware 2005: the 20th ACM/Eurographics Symposium on Graphics Hardware* (Los Angeles, CA, July 2005). Full paper peer review.

"Automatic Shader Level of Detail," *Proceedings of Graphics Hardware 2003: the 18th ACM/Eurographics Symposium on Graphics Hardware* (Los Angeles, CA, July 2003). Full paper peer review.

"Vertex-based Anisotropic Texturing," *Proceedings of Graphics Hardware 2001: the 16th ACM/Eurographics Symposium on Graphics Hardware* (Los Angeles, CA, August 12-13, 2001). Full paper peer review.

"Interactive Multi-Pass Programmable Shading," *Proceedings of ACM SIGGRAPH 2000* (New Orleans, Louisiana, July 23-28, 2000). Full paper peer review.

"Reflection Space Image Based Rendering," *Proceedings of ACM SIGGRAPH 99* (Los Angeles, California, August 8-13, 1999). Full paper peer review.

"A Shading Language on Graphics Hardware: The PixelFlow Shading System," *Proceedings of ACM SIGGRAPH 98* (Orlando, Florida, July 19-24, 1998). Full paper peer review.

"Triangle Scan Conversion Using 2D Homogeneous Coordinates," *Proceedings of Graphics Hardware 1997: the 10th ACM/Eurographics Workshop on Graphics Hardware* (Los Angeles, CA, August 2-4, 1997). Full paper peer review.

“Real-Time Programmable Shading,” Proceedings of I3D 1995: the 4th ACM Symposium on Interactive 3D Graphics (Monterey, CA, April 9-12, 1995). Full paper peer review.

Other Professional Presentations

Conference Courses and Tutorials

Marc Olano (organizer/lecturer), David Blythe, Larry Gritz, Mark Kilgard, Michael McCool, Fabio Pellacini, Pedro Sander (lecturers), *GPU Shading and Rendering*, Full-day course, SIGGRAPH 2006, Boston, MA, August 2006. Juried: Proposal selection by course committee.

Marc Olano (organizer/lecturer), Avi Bleiweiss, Larry Gritz, John C. Hart, Mark Kilgard, Michael McCool, Pedro Sander (lecturers), *GPU Shading and Rendering*, Full-day course, SIGGRAPH 2005, Los Angeles, CA, August 2005. Juried: Proposal selection by course committee.

Marc Olano (organizer/lecturer), Kurt Akeley, John C. Hart, Wolfgang Heidrich, Michael McCool, Jason L. Mitchell and Randi Rost (lecturers), *Real-Time Shading*, Full-day course, SIGGRAPH 2004, Los Angeles, CA, August 2004. Juried: Proposal selection by course committee.

Marc Olano (organizer/lecturer), Kurt Akeley, John C. Hart, Wolfgang Heidrich, Bill Mark, Jason L. Mitchell and Randi Rost (lecturers), *Real-Time Shading*, Full-day course, SIGGRAPH 2003, San Diego, CA, July 2003. Juried: Proposal selection by course committee.

Marc Olano (organizer/lecturer), John C. Hart, Wolfgang Heidrich, Bill Mark and Ken Perlin (lecturers), *Real-Time Shading Languages*, Full-day course, SIGGRAPH 2002, San Antonio, TX, July 2002. Juried: Proposal selection by course committee.

Marc Olano (organizer/lecturer), Chas Boyd, Bill Mark, Michael McCool, Jason L. Mitchell and Randi Rost (lecturers), *State of the Art in Shading Hardware*, Full-day course, SIGGRAPH 2002, San Antonio, TX, July 2002. Juried: Proposal selection by course committee.

Marc Olano (organizer/lecturer), John C. Hart, Wolfgang Heidrich, Erik Lindholm, Michael McCool, Bill Mark and Ken Perlin (lecturers), *Real-Time Shading*, Full-day course, SIGGRAPH 2001, Los Angeles, CA, August 2001. Juried: Proposal selection by course committee.

Marc Olano (organizer/lecturer), John C. Hart, Wolfgang Heidrich, Michael McCool, Bill Mark and Kekoa Proudfoot (lecturers), *Approaches for Procedural Shading on Graphics Hardware*, Full-day course, SIGGRAPH 2000, New Orleans, LA, July 2000. Juried: Proposal selection by course committee.

Conference Presentations (Invited)

Mark Segal (moderator), Marc Olano, Dave Luebke, Mike Doggett, Bill Mark, *Panel: whither graphics hardware and Graphics Hardware*, ACM SIGGRAPH/Eurographics Symposium on Graphics Hardware, August 2007.

Marc Olano, *Programming Graphics Hardware*, UMBC CSEE Research Review, May 2007.

Marc Olano, *Interactive Realism with Multi-Pass Rendering*, NIST Workshop on Metrology and Modeling of Color and Appearance, National Institute of Standards and Technology, Gaithersburg, MD, March 2000.

Other Invited Presentations

Marc Olano, *LEAN Mapping: research experience at a game company*, University of Iowa, November, 2010.

Marc Olano, *UMBC Games, Animation and Interactive Media*, International Game Developers Association, Washington DC Chapter, September 2007.

Marc Olano, *Real-Time Shading*, NIST, Gaithersburg, MD, June 2006.

Marc Olano, *The Future of Shading Language Compilation*, NYU, New York, NY, October 2004.

Marc Olano, *The Future of Shading Language Compilation*, ATI, Santa Clara, CA, August 2003.

Marc Olano, *Interactive Procedural Shading*, University of Maryland, College Park, MD, November 2002.

PRESS

BMore Media, "Video: Gaming at UMBC", 5/26/2011.

Terri Hogan, "Sherwood students pit gaming skills against international teams," Maryland Business Gazette, 3/17/2010.

Kevin Rector, "Global Game Jam features a packed weekend at UMBC," Catonsville Times, 2/4/2009.

Matt Vensel, "Weird 101: Baltimore's unusual college courses," B Daily, 10/1/2008.

Tricia Bishop, "Gamer Making a Career of it: Student develops games, gets Microsoft's attention," Baltimore Sun, 7/24/2008 (Lead article, Business section).

Chris Emery, "Serious About Games," ACM Tech News, 4/23/2008.

Chris Emery, "Video Games, from Scratch," Baltimore Sun, 4/20/2008 (Front page article, Sunday paper).

Staff, "Concrete Flow Researchers to use Argonne Supercomputer," Science Daily, 1/24/2008.

Michael E. Newman, "Concrete Flow Researchers to use Argonne Supercomputer," NIST Tech Beat, 1/23/2008 (appeared on www.nist.gov front page).

Steve Berberich, "Video Games Starting to get Serious: Producers Target Military, Medical, Education Clients," Maryland Business Gazette, 8/31/2007

SERVICE TO THE DEPARTMENT, UNIVERSITY, COMMUNITY AND PROFESSION

Department

Curriculum Development

2007–present	Director, UMBC CMSC BS Game Development Track
2007	Lead design and creation of UMBC CMSC Game Development Track

Committees

2002–present	Member, Graduate Committee, Computer Science
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2004–2006,2011 Chair, Graduate Admissions Committee, Computer Science
 2004–2005 Member, Publicity Committee
 2003–2004 Member, Equipment Committee
 2002–2004 Member, CS Graduate Admissions Subcommittee
 2003 Chair, Departmental Image Working Group

University

2007–2009 Faculty advisor, UMBC Game Development Club

Community

2006–2008 Treasurer, Hill East Community Garden

COURSES

Fall 2008 UMBC CMSC 611, *Advanced Computer Architecture*
 Spring 2008 UMBC CMSC 435/634, *Introduction to Computer Graphics*
 Spring 2008 UMBC CMSC 635, *Advanced Computer Graphics*
 Fall 2007 UMBC CMSC 491G/691G, *Computer Graphics for Games*
 Spring 2007 UMBC CMSC 635, *Advanced Computer Graphics*
 Fall 2006 UMBC CMSC 435/634, *Introduction to Computer Graphics*
 Spring 2006 UMBC CMSC 611, *Advanced Computer Architecture*
 Fall 2005 UMBC CMSC 635, *Advanced Computer Graphics*
 Spring 2005 UMBC CMSC 491G/691G, *Real-Time Shading*
 Fall 2004 UMBC CMSC 435/634, *Introduction to Computer Graphics*
 Spring 2004 UMBC CMSC 491E/691E, *Computer Graphics for Games*
 Spring 2004 UMBC CMSC 435/634, *Introduction to Computer Graphics*
 Fall 2003 UMBC CMSC 611, *Advanced Computer Architecture*
 Spring 2003 UMBC CMSC 635, *Advanced Computer Graphics*
 Fall 2002 UMBC CMSC 435/634, *Introduction to Computer Graphics*
 Spring 2000 Stanford CS 448, *Real-Time Programmable Shading* (with Bill Mark)
 Fall 1994 UNC CS 136, *Introduction to Computer Graphics*

Profession**Standards Organizations**

2002–2009 Participant OpenGL Shading Language Working Group
 Active participant defining OpenGL's Shading Language
 2006–2009 Invited Expert Khronos Group
 OpenGL Architecture Review Board Steering Group
 2002–2006 Individual Member OpenGL Architecture Review Board
 Graphics Standards Organization, merged with Khronos Group

Conference Organization

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|------|---|
| 2011 | Industry Co-Chair, I3D 2011: ACM SIGGRAPH 2011 Symposium on Interactive 3D Graphics and Games, San Francisco, CA, February 2011 |
| 2006 | Papers Co-Chair, Eurographics/ACM SIGGRAPH 2006 Symposium on Graphics Hardware, Vienna, Austria, September 2006. |
| 2006 | Papers Co-Chair, I3D 2006: ACM SIGGRAPH 2006 Symposium on Interactive 3D Graphics and Games, Redwood City, CA, April 2006. |
| 2005 | General Co-Chair, I3D 2005: ACM SIGGRAPH 2005 Symposium on Interactive 3D Graphics and Games, Washington, DC, April 2005. |

Program Committees and Editorial Boards

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|-----------|---|
| 2008–2009 | Papers Program Committee, ACM SIGGRAPH |
| 2008 | Editorial Board, Journal of Scientific Programming, Special Issue on High Performance Computing on the Cell BE Processor. |
| 2005–2008 | Program Committee, I3D: ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games (includes years as chair) |
| 2006–2007 | Program Committee, SIBGRAPI: The Brazilian Symposium on Computer Graphics and Image Processing |
| 2005–2007 | Program Committee, GRAPP: International Conference on Computer Graphics Theory and Applications |
| 2000–2007 | Program Committee, ACM SIGGRAPH/Eurographics Graphics Hardware (includes year as chair) |

Reviews

- | | |
|-------------|--|
| Books | Addison-Wesley, AK Peters, CRC Press, Elsevier. |
| Journals | Computers and Graphics, ACM Transactions on Graphics, IEEE Transactions on Visualization and Computer Graphics, IEEE Computer Graphics and Applications, Visual Computer, ACM Journal of Graphics Tools, International Journal of Computers and Applications, Optical Engineering, Progress in Electromagnetics Research |
| Conferences | ACM SIGGRAPH papers, courses and sketches, ACM SIGGRAPH Asia, Eurographics, Eurographics Workshop on Rendering, IEEE Visualization, IEEE InfoVis, ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games, SIGGRAPH/Eurographics Graphics Hardware, Pacific Graphics, ACM SIGGRAPH Symposium on Real-time Ray Tracing. |
| Funding | NSF ITR, NSF CPA |

Memberships

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|--------------|--|
| 2008–present | IGDA (International Game Developers Association) |
| 2006–present | Eurographics (European Association for Graphics) |
| 1989–present | ACM (Association for Computing Machinery) |
| | ACM SIGGRAPH (Special Interest Group for Graphics) |

1987–present IEEE (Institute of Electrical and Electronics Engineers)
IEEE Computer Society