

CURRICULUM VITAE

Anselmo A. Lastra

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Durham, NC 27701
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(919) 260-9772

CURRENT EMPLOYER: none

EDUCATION:

1988 Duke University, Durham, NC - Ph.D. in Computer Science
M.A. in Computer Science from Duke
1972 BSEE from Georgia Institute of Technology

PROFESSIONAL EXPERIENCE:

2017- Professor Emeritus, University of North Carolina at Chapel Hill.

2009-2014 Department Chair

2006-2017 Professor of Computer Science, and Research Associate of the Research Laboratories of Archaeology, University of North Carolina. Engaged in research in the area of computer graphics, principally rendering, image-based rendering and modeling, and hardware.

2006-2009 Director of Graduate Studies

2001-2006 Associate Professor of Computer Science, University of North Carolina.

1997-2001 University of North Carolina. Research Associate Professor.

1991-1997 University of North Carolina at Chapel Hill. Research Assistant Professor of Computer Science. Software Manager for the Pixel-Planes team. Over this time we completed the Pixel-Planes 5 and (with colleagues at Hewlett Packard) PixelFlow parallel graphics computers.

1988-1991 Duke University. Research Assistant Professor of Computer Science. Research in the areas of parallel processing and performance, and computational science.

Updated November 20, 2024

Working on problems in non-linear excitable media, and the mathematical aspects of genetics. Interests in graphics, and pattern recognition.

1986-1988 Duke University. Graduate student in the Department of Computer Science. Dissertation research on parallel algorithms for the simulation of biological processes at the cellular level. Related research topics in the prediction of the performance of parallel algorithms, and debugging of parallel programs.

1986 AT & T Bell Laboratories. Consultant for one year on a project to develop a special purpose dataflow machine for signal processing. Responsible for technical supervision of several people as well as software design.

1979-1985 Duke University and Duke University Medical Center. Research Assistant in the Department of Medicine and graduate student in the Department of Computer Science. Research in pattern recognition, both statistical and structural. Developed two systems for automated recognition and classification of electrocardiograms. Work in graphics, UNIX kernel, and embedded systems.

Previous Coulter Electronics, Inc., Hialeah, Florida. Project Engineer. Managed design and development team of six to ten persons involved in hardware and software design of laboratory instrumentation. Supervised one product, the Coulter Lytning, completely from initial design to production.

Scidata, Inc., Atlanta, Ga. Electronic Engineer.

PUBLICATIONS

BOOK CHAPTER

Lastra, Anselmo, "The Unix Programming Environment" in *Mastering Tools, Taming Daemons: Unix for the Wizard Apprentice*, D. Brock, ed., McGraw Hill, 1995, ISBN: 1-884777-07-4, 69-110.

REFEREED

Lincoln, Peter, Andrei State, Turner Whitted, Anselmo Lastra, and Henry Fuchs, "From Motion to Photons in 80 Microseconds: Towards Minimal Latency for Virtual and Augmented Reality," IEEE VR, to appear, 2016.

Feng Zheng, Andrei State, Andrew Maimone, Turner Whitted, Anselmo Lastra, Peter Lincoln, and Henry Fuchs, "Minimizing Latency for Augmented Reality Displays: Frames Considered Harmful," ISMAR 2014.

Jeff Pool, Anselmo Lastra, and Montek Singh, Lossless Compression of Variable-Precision Floating-Point Buffers on GPUs, Symposium on Interactive 3D Graphics, Costa Mesa, CA, 9-11 March 2012.

Jeff Pool, Anselmo Lastra, and Montek Singh, Precision Selection for Energy-Efficient Pixel Shaders, High Performance Graphics 2011, Vancouver, 5-7 August 2011.

Jeff Pool, Anselmo Lastra, and Montek Singh, Power-Gated Arithmetic Circuits for Energy-Precision Tradeoffs in Mobile Graphics Processing Units, J. Low Power Electron. 7, 148-162, 2011.

Jeff Pool, Anselmo Lastra and Montek Singh, An Energy Model for Graphics Processing Units, IEEE International Conference on Computer Design, 2010.

Amela Sadagic, Greg Welch, Chumki Basu, Chris Darken, Rakesh Kumar, Henry Fuchs, Hui Cheng, Jan-Michael Frahm, Mathias Kolsch, Neil Rowe, Herman Towles, Juan Wachs, and Anselmo Lastra. New Generation of Instrumented Ranges: Enabling Automated Performance Analysis. In Proceedings of 2009 Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC-2009), 2009.

Jeff Pool, Anselmo Lastra and Montek Singh, Energy-Precision Tradeoffs in Mobile Graphics Processing Units, IEEE International Conference on Computer Design, Lake Tahoe, 2008.

Joshua Steinhurst, Greg Coombe and Anselmo Lastra, Reducing Photon Mapping Bandwidth by Query Reordering, IEEE Transactions on Visualization and Computer Graphics, (14) 1, 13-24, 2008.

Kok-Lim Low and Anselmo Lastra, Predetermination of ICP Registration Errors and Its Application to View Planning, 3-D Digital Imaging and Modeling (3DIM), Montreal, Canada, August 2007.

Massimo Brizzi, Sarah Court, Ascanio d'Andrea, Anselmo Lastra and Daniele Sepio, 3D Laser Scanning as a Tool for Conservation: The Experiences of the Herculaneum Conservation Project, Symposium on Virtual Reality, Archaeology and Cultural Heritage (VAST), Nicosia, Cyprus, 2006.

Kok-Lim Low and Anselmo Lastra, An Adaptive Hierarchical Next-Best-View Algorithm for 3D Reconstruction of Indoor Scenes, Proceedings of 14th Pacific Conference on Computer Graphics and Applications (Pacific Graphics 2006), Taipei, Taiwan, 2006.

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Joshua Steinhurst and Anselmo Lastra, Global Importance Sampling of Glossy Surfaces using the Photon Map, IEEE Symposium on Interactive Ray Tracing, Salt Lake City, Utah, 2006.

Chad Hantak and Anselmo Lastra, Metrics and Optimization Techniques for Registration of Color to Laser Range Scans, Symposium on 3D Data Processing, Visualization and Transmission (3DPVT), Chapel Hill, NC, 2006.

Greg Coombe and Anselmo Lastra, An Incremental Weighted Least Squares Approach to Surface Lights Fields, GRAPP 2006, International Conference on Computer Graphics Theory and Applications, Setúbal, Portugal, 25 - 28 February, 84-91, 2006.

Greg Welch, Ruigang Yang, Sascha Becker, Adrian Ilie, Dan Russo, Jesse Funaro, Andrei State, Kok-Lim Low, Anselmo Lastra, Herman Towles, Bruce Cairns, M.D., Henry Fuchs, and Andy van Dam. Immersive Electronic Books for Surgical Training. *IEEE Multimedia*, 22-35, July-Sept 2005.

David K. McAllister, Anselmo Lastra, Measuring and Rendering Spatially-Varying Fabrics, *Research Journal of Textile and Apparel*, (9) 1, 1-12, 2005.

Justin Hensley, Thorsten Scheuermann, Montek Singh, Anselmo Lastra, Fast Summed-Area Table Generation and its Applications, Proceedings of Eurographics 2005 and Computer Graphics Forum (24) 3, 547-555, 2005.

Justin Hensley, Montek Singh, and Anselmo Lastra, A Fast, Energy-Efficient Z-Comparator, Proceedings of Graphics Hardware 2005, Los Angeles, 41-44, 2005.

Greg Coombe, Chad Hantak, Radek Grzeszczuk, Anselmo Lastra, Online Construction of Surface Light Fields, Eurographics Symposium on Rendering, 83-90, 2005.

Josh Steinhurst, Greg Coombe, Anselmo Lastra, Reordering for Cache Conscious Photon Mapping, Proceedings of Graphics Interface 2005, May 9-11, Victoria, British Columbia, Canada, 97-104, 2005.

Justin Hensley, Anselmo Lastra, Montek Singh, A Scalable Counterflow-Pipelined Asynchronous Radix-4 Booth Multiplier, Proceedings of the 11th IEEE International Symposium on Asynchronous Circuits and Systems, IEEE Computer Society, Washington, DC, USA, 128-137, 2005.

Justin Hensley, Anselmo Lastra, Montek Singh: An Area- and Energy-Efficient Asynchronous Booth Multiplier for Mobile Devices. ICCD 2004: 18-25, IEEE Press, 2004.

Nathaniel Williams, Kok-Lim Low, Chad Hantak, Mark Pollefeys, and Anselmo Lastra, Automatic Image Alignment for 3D Environment Modeling, Proceedings of SIBGRAPI 2004, Curitiba, Brazil, October 17-20, 2004, 388-395.

Ilie, Adrian, Kok-Lim Low, Greg Welch and Anselmo Lastra, "Combining Head-Mounted and Projector-Based Displays for Surgical Training", *Presence: Teleoperators and Virtual Environments* 13(2), 128-145, MIT Press, 2004.

Greg Coombe, Mark J. Harris, and Anselmo Lastra, Radiosity on Graphics Hardware, Proceedings of Graphics Interface 2004, May 17-19, London, Ontario, Canada, 2004, AK Peters, 161-168, 2004.

Nathaniel Williams, Chad Hantak, Kok-Lim Low, John Thomas, Kurtis Keller, Lars Nyland, David Luebke, and Anselmo Lastra, Monticello Through the Window, Proceedings of the 4th International Symposium on Virtual Reality, Archaeology and Intelligent Cultural Heritage (VAST2003), Brighton, UK (November 2003), 131-138.

Kok-Lim Low and Anselmo Lastra, Reliable and Rapidly-Converging ICP Algorithm Using Multiresolution Smoothing, 4th IEEE International Conference on 3-D Digital Imaging and Modeling (3DIM 2003), 171-178, October 2003.

Updated November 20, 2024

Celso Setsuo Kurashima, Anselmo Lastra, Marcelo Knorich Zuffo, A Virtual Simulation Tool for Development of Image-based Rendering Algorithms, Proceedings of 6th SVR Symposium on Virtual Reality. SBC Brazilian Computer Society, October 15-18, 2003. pp.60-70.

Mark J. Harris, William Baxter, Thorsten Scheuermann, Anselmo Lastra, Simulation of Cloud Dynamics on Graphics Hardware, Graphics Hardware 2003, San Diego, California, July 26-27, 92-101, 2003.

Kok-Lim Low, Adrian Ilie, Greg Welch, and Anselmo Lastra, Combining Head-Mounted and Projector-Based Displays for Surgical Training, Proceedings of IEEE Virtual Reality 2003. Los Angeles, California, March 22-26, 2003.

Ruigang Yang, Celso Kurashima, Andrew Nashel, Herman Towles, Anselmo Lastra, Henry Fuchs, Creating Adaptive Views for Group Video Teleconferencing – An Image-Based Approach, Proceedings of International Workshop on Immersive Telepresence (ITP2002), Juan Les Pins, France, December 6, 2002.

Kurashima, Celso, Ruigang Yang, and Anselmo Lastra, Combining Approximate Geometry with View-Dependent Texture Mapping – A Hybrid Approach to 3D Video Teleconferencing, Proc. of the 15th Brazilian Symposium on Computer Graphics and Image Processing, SIBGRAPI'02, Fortaleza, CE, Brazil, October 7-10, 2002

Harris, Mark J., Greg Coombe, Thorsten Scheuermann, and Anselmo Lastra, Physically-Based Visual Simulation on Graphics Hardware, Graphics Hardware 2002, Saarbrucken, Germany, September 1-2, 109-118.

McAllister, David K., Anselmo A. Lastra, and Wolfgang Heidrich, Efficient Rendering of Spatial Bi-directional Reflectance Distribution Functions, Graphics Hardware 2002, Saarbruecken, Germany, September 1-2, 79-88.

Kok-Lim Low, Greg Welch, Anselmo Lastra and Henry Fuchs, Life-Sized Projector-Based Dioramas, *ACM Symposium on Virtual Reality Software and Technology 2001 (VRST 2001)*, November 2001.

Harris, Mark, and Anselmo Lastra, Real-Time Cloud Rendering, Computer Graphics Forum (Eurographics 2001 Proceedings), 20(3):76-84, Manchester, UK, September 4-7, 2001.

Popescu, Voicu, Anselmo Lastra, The Vacuum Buffer, Proceedings of the 2001 *ACM Symposium on Interactive 3D Graphics*, Research Triangle Park, NC, March 19-21, 2001, 73-76.

Popescu, Voicu, Anselmo Lastra, John Eyles, Sort-First Parallelism for Image-Based Rendering, *Proceedings of Eurographics Workshop on Parallel Graphics and Visualization*, Girona, Spain, September 2000, 93-101.

Popescu, Voicu, John Eyles, Anselmo Lastra, Josh Steinhurst, Nick England and Lars Nyland, WarpEngine: An Architecture for the Post-Polygonal Age, *Proceedings of SIGGRAPH 2000*, New Orleans, July 2000, 433-442.

Lars Nyland, David McAllister, Voicu Popescu, Chris McCue, and Anselmo Lastra. Interactive exploration of acquired 3D data. Proceedings of the SPIE Applied Image and Pattern Recognition Conference, October 13-15, 1999

Aliaga, Daniel and Anselmo Lastra, Automatic Image Placement to Provide a Guaranteed Frame Rate, *Proceedings of SIGGRAPH 99*, Los Angeles, August 11-13, 1999, 307-316.

Chang, Chun-Fa, Gary Bishop, and Anselmo Lastra, LDI Tree: A Hierarchical Representation for Image-based Rendering, *Proceedings of SIGGRAPH 99*, Los Angeles, August 11-13, 1999, 291-298.

McAllister, David K., Lars Nyland, Voicu Popescu, Anselmo Lastra, Chris McCue. Real-Time Rendering of Real-World Environments, *Rendering Techniques '99, Proceedings of the Eurographics Workshop on Rendering*, (Granada, Spain), June 21-23, 1999.

Lars Nyland, David McAllister, Voicu Popescu, Chris McCue, Anselmo Lastra, Paul Rademacher, Manuel Oliveira, Gary Bishop, Gopi Meenakshisundaram, Matt Cutts, and Henry Fuchs, The Impact of Dense Range Data on Computer Graphics, *Proceedings of Multi-View Modeling and Analysis Workshop (MVIEW99), (Part of CVPR99)*, Fort Collins, CO, June 23-26, 1999.

Bastos, Rui, Kenneth Hoff, William Wynn, and Anselmo Lastra, "Increased Photorealism for Interactive Architectural Walkthroughs", *ACM Symposium on Interactive 3D Graphics*, Atlanta, April 26-28, 1999, pp. 183-190.

Rafferty Matthew M., Daniel G. Aliaga, Voicu Popescu, and Anselmo A. Lastra, "Images for Accelerating Architectural Walkthroughs", *IEEE Computer Graphics & Applications*, **18**:6, pp. 38-45, November/December 1998.

Voicu Popescu, Anselmo Lastra, Daniel Aliaga, Manuel Oliveira Neto, "Efficient Warping for Architectural Walkthroughs using Layered Depth Images", *IEEE Visualization '98*, pp. 211-215, October 18-23, 1998.

Aliaga, Daniel G. and Anselmo A. Lastra, "Smooth Transitions in Texture-based Simplification", *Computer & Graphics*, Elsevier Science, **22**:1, pp. 71-81, 1998.

Rafferty, Matthew M., Daniel G. Aliaga, and Anselmo A. Lastra, 3D Image Warping in Architectural Walkthroughs, *Proceedings of VRAIS 98, (also UNC Computer Science Technical Report TR97-019, September 1997)*.

Olano, Marc and Anselmo Lastra, "A Shading Language on Graphics Hardware: The PixelFlow Shading System", *Proceedings of SIGGRAPH 98*, pp. 159-168, Orlando, Florida, July 19-24, 1998.

Aliaga, Daniel. G. and Anselmo Lastra, Architectural Walkthroughs Using Portal Textures, *Proceedings of IEEE Visualization 97*, Phoenix, AZ, October 19-24, 1997, 355-362.

Eyles, John, Steve Molnar, John Poulton, Trey Greer, Anselmo Lastra, and Nick England, PixelFlow: The Realization, *Proceedings of the SIGGRAPH/Eurographics Workshop on Graphics Hardware*, Los Angeles, CA, August 3-4, 1997, 57-68.

Kumar, Subodh, Dinesh Manocha, and Anselmo Lastra, Interactive Display of Large NURBS Models, *IEEE Transactions on Visualization and Computer Graphics*, December 1996, 323-336.

Hughes, Merlin, Anselmo Lastra, and Edward Saxe, Simplification of Global-Illumination Meshes, *Proceedings of Eurographics '96*, Computer Graphics Forum, **15**(3), August 1996, 339-345.

Lastra, Anselmo, Reducing Latency on PixelFlow, *Proc. of the Eurographics Workshop on Graphics Hardware*, 43-50, August 1995.

Lastra, Anselmo, Steve Molnar, Marc Olano and Yulan Wang, Real-Time Programmable Shading, *Proc. of the 1995 Symposium on 3D Interactive Graphics, SIGGRAPH*, 1995, 59-66.

Kumar, Subodh, Dinesh Manocha, and Anselmo Lastra, Interactive Display of Large-Scale NURBS Models, *Proc. of the 1995 Symposium on 3D Interactive Graphics, SIGGRAPH*, 1995, 51-58.

Nesterenko, V. V., Lastra, A. A., Grant, A. O. Rosenshtraukh, L. V., Starmer, C. F. A Proarrhythmic Response to Sodium Channel Blockade: The Influence of Antiarrhythmic Drugs on the Window of Vulnerability in Guinea Pig Myocardium. *Journal of Clinical Pharmacology*, **19**, No. 5, 810-820 (1992).

Speer, M. C., Yamaoka, L. H., Gilchrist, J. M., Gaskell, C. P., Stajich, J. M., Vance, J. M., Kazantsev, A., Lastra, A. A., Haynes, C. S., Beckmann, J. S., Weber, J. L., Roses, A. D., Pericak-Vance, M. A., Confirmation of Genetic Heterogeneity in Limb-Girdle Muscular Dystrophy: Linkage of an Autosomal Dominant Form to Chromosome 5q. *American Journal of Human Genetics*, June 1992.

Starmer, C. F., Lancaster, A. R., Lastra, A. A., Grant, A. O., Cardiac Instability Amplified by Use-Dependent Na Channel Blockade, *American Journal of Physiology*, **262**, H1305-H1310, 1992.

Starmer, C. F., Lastra, A. A., Nesterenko, V. V. Grant A. O., A Proarrhythmic Response to Sodium Channel Blockade: Theoretical Model and Computer Simulations, *Circulation* **84**, No.3, 1364-1377 (1991).

Lastra, A. A., and Starmer, C. F., POET: A Tool for the Analysis of the Performance of Parallel Algorithms, *Proc. 1988 Int. Conf. on Parallel Processing*, Pennsylvania State University Press, University Park, 126-129,1988.

Simpson, E. V., Lastra, A. A., Pritchett, E. L. C. and Smith, W. M., A time-sharing computer system for rhythm analysis of long-term electrocardiographic data. *Proc. 9th Ann. Conf. IEEE Eng. Med. Biol. Soc.* (1987) 914-915.

Lastra, A. A., Pritchett, E. L. C., Reiter, M. J., Smith, M. S., and Smith, W. M., A System for the Analysis of Long-Term Electrocardiographic Studies in Clinical Research and Training. *Computers and Biomedical Research* (1983) 340-346.

EXHIBITION

Virtual Monticello exhibition at the New Orleans Museum of Art, April-August 2003. This was a facade, 17 meters long, of Thomas Jefferson's home, Monticello, with two rear-projected, tracked, virtual-environment displays. It was experienced by 110,000 visitors. Please see <http://www.cs.unc.edu/~ibr/projects/NOMA/index.html> for details.

PATENTS

Fuchs, Henry, Anselmo A. Lastra, Jan-Michael Frahm, Nate Michael Dierk, David Paul Perra, "Low latency stabilization for head-worn displays," US Patent number 9,898,866B2, issued February 20, 2018.

Fuchs, Henry, Anselmo A. Lastra, John Turner Whitted, Feng Zheng, Andrei State, Gregory Welch, "Minimal-latency tracking and display for matching real and virtual worlds in head-worn displays," US Patent number 11049476B2, issued November 30, 2017.

Popescu, Voicu Anselmo Lastra, John Eyles, "Methods and apparatus for rendering images using 3D warping techniques," US Patent number 6,756,993, issued June 29, 2004.

CONFERENCE (un-refereed)

Anselmo Lastra, Ascanio d'Andrea and Daniele Sepio, Swivel-Chair VR: A Portable HMD System (poster presentation), *Virtual Systems and Multimedia (VSMM)*, Brisbane, Australia, September 2007.

Jerald, Jason Andrew Fuller, Anselmo Lastra, Mary Whitton, Luv Kohli, Fred Brooks, Latency Compensation by Horizontal Scanline Selection for Head-Mounted Displays, *Proceedings of the SPIE conference on The Engineering Reality of Virtual Reality*, January 2007.

Hensley, Justin, Thorsten Scheuermann, Montek Singh, Anselmo Lastra, Interactive Summed-Area Table Generation for Glossy Environmental Reflections, *ACM SIGGRAPH 2005 Sketches and Applications*, 2005.

Wei-Chao Chen, Lars Nyland, Anselmo Lastra, Henry Fuchs, Acquisition of Large-Scale Surface Light Fields, *ACM SIGGRAPH 2003 Sketches and Applications*, July 2003.

David K. McAllister, Benjamin P. Cloward, Anselmo A. Lastra and Wolfgang Heidrich, Spatial Bi-Directional Reflectance Distribution Functions, *ACM SIGGRAPH 2002 Sketches and Applications*, July 2002.

Kok-Lim Low, Greg Welch, Anselmo Lastra and Henry Fuchs, Life-Sized Projector-Based Dioramas: Spatially Real and Visually Virtual, *ACM SIGGRAPH 2001 Sketches and Applications*, August 2001.

Nyland, Lars, Anselmo Lastra, David McAllister, Voicu Popescu, and Chris McCue, Capturing and Rendering of Real-World Scenes, Videometric and Optical Methods for 3D Shape Measurement, Photonics West, San Jose, CA, January 2001.

Daniel Aliaga and Anselmo Lastra, "Virtual Backdrops", Technical Sketch, Visual Proceedings, ACM SIGGRAPH, August, 1997.

Lastra, Anselmo, Henry Fuchs, and John Poulton, Harnessing Parallelism for High-Performance Interactive Computer Graphics, *Proceedings of NSF Workshop on Experimental Systems*, June 1996.

Lastra, Anselmo and Steve Molnar, PixelFlow: The Continuing Saga, *Proc. 1995 Parallel Rendering Symposium*, ACM SIGGRAPH, ISBN: 0-89791-74-1, 79, September 1995.

OTHER

Nyland, Lars and Anselmo Lastra, Visualizing the Real World, IEEE Computer Graphics and Applications, Sept. 2001.

Nyland, Lars and Anselmo Lastra, Rangefinder / Digital Camera System Renders Real-World Scenes, Laser Focus World, June 2001.

Lastra, Anselmo A., Technology for Virtual Reality, *Siggraph 97 Course Notes*, A. Lastra, ed., ACM SIGGRAPH, August 1997.

Olano, Marc, Anselmo Lastra, and Jon Leech, Procedural Primitives in a High Performance, Hardware Accelerated, Z-Buffer Renderer, UNC Computer Science Technical Report TR97--040, 1997.

Lastra, Anselmo, Technology for Virtual Reality, *Siggraph 96 Course Notes*, A. Lastra, ed., ACM SIGGRAPH, August 1996.

Saxe, Edward, Merlin Hughes, and Anselmo Lastra, "Higher-Order Color Interpolation for Real-Time Radiosity Display", UNC-CH Department of Computer Science Technical Report TR96-023, 1996.

Lastra, Anselmo, Technology for Virtual Reality, *SIGGRAPH 95 Course Notes*, A. Lastra, ed., ACM Siggraph, August 1995.

Lastra, Anselmo, Technology for Virtual Reality, *Siggraph 94 Course Notes*, A. Lastra, ed., ACM Siggraph, 3.1 - 3.25, 1994.

Holloway, Richard and Anselmo Lastra, *Virtual Environments: A Survey of the Technology*, Eurographics Technical Notes, ISSN 1017-4656, 1-50, 1993.

Lastra, A. A., and Starmer, C. F., *Architectural Support for Parallel Debugging*, Department of Computer Science Technical Report CS-1989-10, Duke University, Durham, NC, 1989.

TEACHING (number of times taught)

Undergraduate level

Digital Computer Design at UNC (4) – designed and inaugurated new course
Systematic Programming (2) at UNC
First Year Seminar using LEGO Robots (2) at UNC
3D Computer Animation (2) at UNC
Software Design (1), at Duke University
Computer Graphics (2), at Duke University – designed and inaugurated new course

Graduate level

Programming Methodology (3), at Duke University
Advanced Image Generation (5), at UNC – advanced research preparation course
Graphics Hardware (2) at UNC
Computer Architecture (3) at UNC

GRANTS

Principal Investigator, Imperceptible and RealTime 3D Scanning for Biometric Identification and Verification, Department of Homeland Security, \$215,291, 2010-2011.

Principal Investigator, Power-Aware Graphics Hardware, National Science Foundation, \$350,000, 2007-2012.

Principal Investigator, Fifth Generation Graphics Architectures, National Science Foundation, \$350,000, 2003-2007.

Co-Principal Investigator, Tera-Pixels: Using High-resolution Pervasive Displays to Transform Collaboration and Teaching, National Science Foundation, \$1,066,316, 2003-2008.

Principal Investigator, ITR: Collaborative Research: Image-Based Rendering in Forensic Science, Education, and Historical Preservation, National Science Foundation, collaborative research with the University of Virginia, \$1,190,818 to UNC, \$1,439,054 total, 2002-2006.

Senior Investigator (and proposal editor), Real-Time Long-Distance Terascale Computation for Full Bandwidth Tele-Immersion, National Science Foundation, \$2,651,500, 2001-2004.

Co-Principal Investigator with Frederick P. Brooks Jr. and Dinesh Manocha – Real-Time Walkthroughs of Serious Synthetic Environments, National Science Foundation, \$470,000, 1999-2002.

Co-Principal Investigator with Dinesh Manocha, ASCI Program, Department of Energy, 1999-2002.

Co-Principal Investigator (and proposal editor) with Henry Fuchs, Frederick P. Brooks Jr., Gary Bishop and Dinesh Manocha - Acquisition of a Graphics

Supercomputer for Synthetic Environments Serving Science and Engineering,
National Science Foundation, \$1.3 million, 1998-2001.
Co-Principal Investigator (and proposal editor) – Intel equipment grant, \$2.5 million, 1997-
2000.
Senior Investigator – ImageFlow: Real-Time Image-Based Rendering, DARPA, \$2.1
million, 1995-1998.
Senior Investigator – ImageFlow: Real-Time Image-Based Rendering, National Science
Foundation, \$2.1 million, 1995-1999.
Principal Investigator - Computer Solutions to Multipoint Linkage Analysis, National
Institutes of Health grant 2P50AGO5128, 1990 - 1992.
Principal Investigator - Cray Research Grant, 1991.

PROFESSIONAL ACTIVITIES

Steering committee for the BeingThere Center, 2010-
Steering committee for High Performance Graphics, 2009-
Co-Treasurer, High Performance Graphics 2012, Paris
Associate Editor and Tutorials Editor, IEEE Computer Graphics and Applications 2007-
2011
Associate Editor, IEEE Transactions on Visualization and Computer Graphics, 2003-2007
Co-Treasurer, High Performance Graphics 2011, Vancouver
Steering committee for Graphics Hardware conferences, 2005-2009
Co-Treasurer, High Performance Graphics 2010, Saarbrücken
Program committee, Computer Applications in Archaeology (CAA) 2010
Program committee, Symposium on Interactive 3D Graphics (I3D) 2010
Co-Treasurer, High Performance Graphics 2009, New Orleans
Program Committee, eHeritage 2009
Program Committee, Symposium on Interactive 3D Graphics (I3D) 2009
Co-Treasurer, Graphics Hardware 2008, Sarajevo
Program Committee, Symposium on Interactive 3D Graphics (I3D) 2008
Co-Treasurer, Graphics Hardware 2007, San Diego
Program Committee, Symposium on Interactive 3D Graphics (I3D) 2007
Program committee, SIAGC 2006
Program committee, 3DPVT 2006
Program committee, ACM SIGGRAPH Video Game Symposium 2006
Program committee, Symposium on Point-Based Graphics 2006
Program committee, SIBGRAPI 2006
Program committee, EVA 2006, Austria
Program committee, Graphics Hardware 2006
Program committee, Symposium on Interactive 3D Graphics (I3D) 2006
Program committee, GRAPP 2006
Program committee, Symposium on Point-Based Graphics 2005

Program committee, Graphics Hardware 2005
Co-Chair, Symposium on Interactive 3D Graphics (I3D) 2005, Washington, DC
Program committee, 3DIM 2005
Co-Chair, Graphics Hardware 2004, Grenoble, France
Co-Chair, Workshop on General Purpose Computation on Graphics Processors, 2004, Los Angeles, CA
Program committee, Symposium on Point-Based Graphics 2004
Chair, Technical Outreach, SIGGRAPH (2003-2005)
Chair, Graphics Hardware 2002, Saarbrucken, Germany
Program co-Chair, Graphics Hardware 2001, Los Angeles
Courses committee, ACM SIGGRAPH 2001
Chair, courses, ACM SIGGRAPH 2000
Papers co-Chair, SIGGRAPH/Eurographics Workshop on Graphics Hardware 2000
Program committee, Immersive Projection Technology Workshop, 2000
Courses committee, ACM SIGGRAPH 99
Courses committee, ACM SIGGRAPH 98

INVITED TALKS

Keynote, *Title Bringing the Real to Virtual Reality*, SIACG 2006.
Capstone, *Modeling the Real World*, SIBGRAPI 2002.
Invited speaker, *Image-Based Rendering and Virtual Environments at UNC Chapel Hill*, EDGE Conference, IBM T.J. Watson Research Labs, April 2002.
Keynote, *Bringing the Real to Virtual Reality*, International Conference for Artificial Reality and Telepresence, Taipei, Taiwan, October 2000.
Image-Based Rendering, Beijing Simulation Center, Beijing, China, May 1999.
Invited speaker, *All the Triangles in the World*, Cornell Workshop on Rendering Perception and Measurement, Ithaca, NY, April 1999.
Capstone, *Virtual Reality: What does the Future Hold?*, Cyberconf 96, Madrid, June 96.
Invited speaker, *PixelFlow: The Continuing Saga*, Parallel Rendering Symposium, September 1995.

PAST GRADUATE STUDENTS (including MS theses)

Daniel Aliaga, Ph.D., UNC, 1998
Greg Coombe, PhD, 2007
Paul Keller, M.S., UNC, 1996
Mark Harris, PhD, UNC 2003
Justin Hensley, PhD, UNC 2007
Karl Hillesland, PhD, UNC, 2005
John Houde, M.S., Duke, 1990

Kok-Lim Low, Ph.D., UNC, 2006
David K. McAllister, Ph.D., UNC, 2002
Jonathan McAllister, M.S., UNC, 1996
Carl Mueller, Ph.D., UNC, 2000
Sandra Dawson Miller, M.S., Duke, 1990
Thomas Marcolm Olano, Ph.D., UNC, 1997
Jeff Pool, Ph.D., UNC, 2012
Voicu Popescu, Ph.D., UNC, 2001
Joshua Steinhurst, PhD, 2007
Meredith L. Smith, M.S., Duke, 1991

UNIVERSITY SERVICE

Faculty Executive Committee
Committee on Faculty Research and Study Leaves
Faculty Council
SACS Accreditation Committee, UNC Graduate School

DEPARTMENTAL SERVICE

Chairman
Director of Graduate Studies
Graduate Studies Committee
Graduate Curriculum and Planning Committee
Conflicts of Interest Committee
Undergraduate Curriculum Committee
Department Facilities Committee
Graduate Admissions Committee (twice)

PUBLIC SERVICE

2003 – Exhibition at New Orleans Museum of Art to celebrate the 200th anniversary of the Lewis and Clark expedition. Please see item under exhibitions in the publications section.

2004 – Documented a pre-Roman Faliscan tomb in central Italy by creating a 3D geometric model. This work is in collaboration with Professor Nicola Terrenato of the Department of Classics.

2005-6 – Technical advisor on a team to document the Suburban Baths on the Herculaneum archaeological site by creating a 3D model. This work is in collaboration with the British School at Rome.

TESTIMONY AND EXPERT REPORTS

- 2010-11 S3G v. Apple in the International Trade Commission (Apple), Inv. No. 337-TA-724, filed May 28, 2010. Was deposited.
- 2012 GPH v. Sony in the International Trade Commission (Sony), Inv. No. 337-TA-836, filed March 12, 2012.
- 2013-14 GPH v. Toshiba in the International Trade Commission (Toshiba, LG, Vizio), ITC Inv. No. 337-884, filed May 17, 2013. Was deposited and testified at hearing.
- 2013-14 Micrografx v. Google in the Federal Court of the Northern District of Texas (Google), case 3:13-cv-03595-N. Was deposited for Inter Partes Review.
- 2014-15 Ziilabs v. Samsung in the Eastern District of Texas (Samsung), case 2:14-cv-00203-JRG-RSP, filed March 10, 2014. Was deposited.
- 2014-17 Advanced Micro Devices v. LG Electronics in the Northern District of California (LG), case 3:14-cv-1012-SI, filed December 28, 2015.
- 2015 ART+COM vs. Google. Inter Partes Review of RE44,500 (Google).
- 2016 Advanced Silicon Technologies v. Texas Instruments and Renesas in the International Trade Commission (TI and Renesas), filed December 28, 2015. Inv. No. 337-TA-984.
- 2017 Advanced Micro Devices v. LG Electronics, MediaTek, Sigma Devices, and Vizio in the International Trade Commission (LG, MediaTek, Sigma, and Vizio). Inv. No. 337-TA-1044, filed January 24, 2017. Was deposited and testified at hearing.
- 2018 Ziilabs v. NVIDIA in the International Trade Commission (NVIDIA). Inv. No. 337-TA-1099, filed December 29, 2017.
- 2020 Infernal Technology vs. Sony Interactive Entertainment in the Eastern District of Texas (Sony), case 2:19-cv-248-JRG, filed July 11th, 2019. Was deposited and testified at trial.
- 2020 GPU++ v. Qualcomm. Inter Partes Review of 8,988,441 (Qualcomm).
- 2020 Kewazinga v. Google in the Southern District of New York (Google), case 1:20-cv-01106-LGS, filed February 7th, 2020. Was deposited.
- 2022 AMD vs. Realtek in the International Trade Commission, Investigation No. 337-TA-1318.

COMPANIES FOR WHICH I HAVE CONSULTED

- AMD
- Apple
- Google
- LG
- MediaTek
- NVIDIA
- Renesas
- Samsung
- Sigma Devices
- Sony
- Qualcomm
- Texas Instruments
- Toshiba

- Vizio