

# CHRISTIAAN GRIBBLE

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## VITA

June 2018

### Personal Information:

Born: 8 July 1978  
Citizenship: United States of America  
Current position: Principal research scientist  
Current address: Applied Technology Operation  
SURVICE Engineering Company  
1051 Brinton Road, Suite 301  
Pittsburgh, PA 15221  
Phone numbers: 412.342.8219 (office)  
410.272.6763 (fax)  
E-mail address: christiaan.gribble@survice.com

### Education:

University of Utah	PhD/Computer Science	December 2006
Dissertation title:	<i>Interactive Methods for Effective Particle Visualization</i>	
Supervisory committee:	Steven Parker, PhD (chair) Charles Hansen, PhD Victoria Interrante, PhD Christopher Johnson, PhD Peter Shirley, PhD	
Carnegie Mellon University	MS/Information Networking	May 2002
Thesis title:	<i>Parallel Rendering for the Terascale Computing System</i>	
Supervisory committee:	Jessica Hodgins, PhD (chair) Joel Welling, PhD	
Grove City College	BS/Mathematics BA/Political Science	May 2000
Academic honors:	<i>Magna Cum Laude</i>	

### Professional Employment:

SURVICE Engineering Company	Team lead, high performance computing	September 2014-present
SURVICE Engineering Company	Principal research scientist	June 2013-present
SURVICE Engineering Company	Research scientist	May 2012-May 2013
Grove City College	Associate professor	September 2011-August 2012
Grove City College	Assistant professor	January 2007-August 2011
Scientific Computing & Imaging Institute	Postdoctoral research fellow	November 2006-December 2006
Scientific Computing & Imaging Institute	Research assistant	August 2002-October 2006
University of Bristol Computer Graphics Group	Visiting research assistant	August 2005-October 2005
Pittsburgh Supercomputing Center	Research assistant	May 2001-July 2002

### Research Interests:

#### Current

Computer graphics & visualization: Image synthesis & visual simulation; light transport & predictive rendering; interactive rendering

Computer vision: 3D reconstruction; structure-from-motion; photogrammetry; scene measurement & analysis

High performance computing: Scalable parallel rendering algorithms; massively parallel & heterogeneous computing; parallel programming

Other: Non-optical rendering & physics-based simulation

**Past**

Computer graphics & visualization: Light transport simulation for predictive rendering; image synthesis & visual simulation applications; global illumination algorithms; interactive rendering

High performance computing: Scalable parallel rendering algorithms; cluster-based systems; shared & distributed memory systems; high-speed network transport protocols

Other: Computer graphics & visualization in the arts & humanities

**Research Grants, Contracts, & Sponsorship:**

**Current Support**

Organization: Intel Corporation  
Program: N/A  
Total Costs: (undisclosed)  
Project Title: SIMD Optimization for High Performance Radio Frequency Ray Tracing  
Duration: 6 months  
Start Date: June 2018  
Principal Investigator: **C. Gribble**

Organization: Naval Air Warfare Center Weapons Division  
Program: R&D Air Weapons System Support  
Total Costs: \$41K  
Project Title: SHAZAM EV Support  
Duration: 6 months  
Start Date: May 2018  
Principal Investigator: **C. Gribble**

Organization: US Air Force  
Program: SBIR Program – Phase II  
Total Costs: \$750K  
Project Title: Real-Time In-Situ Intelligent Video Analytics for Mobile Platforms  
Duration: 27 months  
Start Date: February 2017  
Principal Investigator: **C. Gribble**

Organization: US Air Force  
Program: SBIR Program – Phase II  
Total Costs: \$750K  
Project Title: Accelerated 3D Reconstruction and Visualization of Compressible Flow  
Duration: 27 months  
Start Date: February 2017  
Principal Investigator: **C. Gribble**

**Past Support**

Organization: Intel Corporation  
Program: N/A  
Total Costs: (undisclosed)  
Project Title: Reinforced Light Transport  
Duration: 3 months  
Start Date: September 2017  
Principal Investigator: **C. Gribble**

Organization: US Army  
 Program: SBIR Program – Phase I  
 Total Costs: \$100K  
 Project Title: Innovative Rendering for Simulation  
 Duration: 6 months  
 Start Date: April 2017  
 Principal Investigator: **C. Gribble**

Organization: Intel Corporation  
 Program: N/A  
 Total Costs: (undisclosed)  
 Project Title: Development of Graph-Based Multi-Hit Module for OSPRay  
 Duration: 4 months  
 Start Date: December 2016  
 Principal Investigator: **C. Gribble**

Organization: National Aeronautics and Space Administration  
 Program: SBIR Program – Phase II  
 Total Costs: \$750K  
 Project Title: High Performance Computing-Accelerated Metrology for Large Optical Telescopes  
 Duration: 2 years  
 Start Date: May 2015  
 Principal Investigator: J. Ebersole

Organization: US Air Force  
 Program: SBIR Program – Phase I  
 Total Costs: \$150K  
 Project Title: Scalable Real-Time Background/Foreground Separation Using Dynamic Mode Decomposition  
 Duration: 9 months  
 Start Date: September 2015  
 Principal Investigator: **C. Gribble**

Organization: US Air Force  
 Program: SBIR Program – Phase I  
 Total Costs: \$150K  
 Project Title: Accelerated 3D Reconstruction and Visualization of Compressible Flow  
 Duration: 9 months  
 Start Date: July 2015  
 Principal Investigator: **C. Gribble**

Organization: US Army Research Laboratory  
 Program: GSA OASIS – Small Business Program  
 Total Costs: \$11.7M  
 Project Title: Visual Simulation Laboratory Methodology Development and Integration of Related Technologies with Survivability, Lethality, and Vulnerability Analysis to Assess US Military and Foreign Systems  
 Duration: 5 years  
 Start Date: July 2015  
 Contract Manager: M. Butkiewicz

Organization: Intel Corporation  
 Program: N/A  
 Total Costs: (undisclosed)  
 Project Title: Accelerated X-ray Computed Tomography Image Processing Framework  
 Duration: 11 months  
 Start Date: February 2015  
 Principal Investigator: **C. Gribble**

Organization: National Aeronautics and Space Administration  
Program: SBIR Program – Phase I  
Total Costs: \$150K  
Project Title: Innovative Non-Contact Metrology Solutions for Large Optical Telescopes  
Duration: 6 months  
Start Date: June 2014  
Principal Investigator: J. Ebersole

Organization: Intel Corporation  
Program: N/A  
Total Costs: (undisclosed)  
Project Title: High Performance Radio Frequency Ray Tracing with Embree  
Duration: 11 months  
Start Date: May 2014  
Principal Investigator: **C. Gribble**

Organization: US Marine Corps  
Program: SBIR Program – Phase II  
Total Costs: \$750K  
Project Title: Post-IED Hull Inspection Tool  
Duration: 2 years  
Start Date: February 2014  
Principal Investigator: R. Baltrusch

Organization: Naval Air Warfare Center Weapons Division  
Program: DSIAC CAT 1190 JASP Program Studies  
Total Costs: \$23.4M  
Project Title: Rotary Wing UAS Survivability Study  
Duration: 6 years  
Start Date: December 2013  
Contract Manager: R. Dexter

Organization: NVIDIA Corporation  
Program: GPU Research Center Program  
Total Costs: N/A  
Project Title: GPU Ray Tracing for Physics-Based Simulation  
Duration: 3 years, 8 months  
Start Date: April 2013  
Principal Investigator: **C. Gribble**

Organization: US Army Research Laboratory  
Program: Army Test and Evaluation Command  
Total Costs: \$627K  
Project Title: Visual Simulation Laboratory Software Engineering Support  
Duration: 2 years  
Start Date: March 2012  
Contract Manager: M. Butkiewicz

Organization: Grove City College  
Program: Swezey Scientific Instrumentation & Research Fund  
Total Costs: \$8.58K  
Project Title: Preparing rtVTK for Open Source Release  
Duration: 6 months  
Start Date: March 2012  
Principal Investigator: **C. Gribble**

Organization: II-VI Foundation  
 Program: Block-Gift Program  
 Total Costs: \$15K  
 Project Title: Ray Tracing Visualization  
 Duration: 8 months  
 Start Date: February 2011  
 Principal Investigator: **C. Gribble**

Organization: Grove City College  
 Program: Swezey Scientific Instrumentation & Research Fund  
 Total Costs: \$9.3K  
 Project Title: Creating a Flexible User Interface for Ray Tracing Visualization  
 Duration: 7 months  
 Start Date: February 2011  
 Principal Investigator: **C. Gribble**

Organization: Grove City College  
 Program: Swezey Scientific Instrumentation & Research Fund  
 Total Costs: \$9.6K  
 Project Title: Interactive Ray Tracing with OpenCL  
 Duration: 4 months  
 Start Date: May 2010  
 Principal Investigator: **C. Gribble**

Organization: Grove City College  
 Program: Swezey Scientific Instrumentation & Research Fund  
 Total Costs: \$9.3K  
 Project Title: Stream Filtered Ray Tracing for the SPI Storm-1 Series Processors  
 Duration: 9 months  
 Start Date: January 2009  
 Principal Investigator: **C. Gribble**

Organization: Grove City College  
 Program: Swezey Scientific Instrumentation & Research Fund  
 Total Costs: \$7.8K  
 Project Title: Integer Ray Tracing  
 Duration: 9 months  
 Start Date: January 2009  
 Principal Investigator: **C. Gribble**

Organization: NVIDIA Corporation  
 Program: Professor Partnership Program  
 Total Costs: N/A  
 Project Title: Continued Support for Computer Science Education & Research at Grove City College  
 Duration: 4 years, 7 months  
 Start Date: February 2008  
 Principal Investigator: **C. Gribble**

Organization: Grove City College  
 Program: Swezey Scientific Instrumentation & Research Fund  
 Total Costs: \$9.2K  
 Project Title: Interactive Ray Tracing for the GPU  
 Duration: 11 months  
 Start Date: October 2007  
 Principal Investigator: **C. Gribble**

Organization: Grove City College  
Program: Swezey Scientific Instrumentation & Research Fund  
Total Costs: \$50K  
Project Title: Establishing the Laboratory for Interactive Visualization, Entertainment, & Mobility (LIVE-M)  
Duration: 5 years, 3 months  
Start Date: May 2007  
Principal Investigator: **C. Gribble**

Organization: NVIDIA Corporation  
Program: Professor Partnership Program  
Total Costs: N/A  
Project Title: Leveraging Programmable GPUs in Education & Research  
Duration: 9 months  
Start Date: May 2007  
Principal Investigator: **C. Gribble**

## **Publications:**

### **Peer-Reviewed Journal Articles**

1. **C. Gribble**, I. Wald, & J. Amstutz. Implementing Node Culling Multi-Hit BVH Traversal in Embree. *Journal of Computer Graphics Techniques*, vol. 5, no. 4, 2016.
2. J. Amstutz, **C. Gribble**, J. Gunther, & I. Wald. An Evaluation of Multi-Hit Ray Traversal in a BVH using Existing First-Hit/Any-Hit Kernels. *Journal of Computer Graphics Techniques*, vol. 4, no. 4, 2015.
3. **C. Gribble**, A. Naveros, & E. Kerzner. Multi-Hit Ray Traversal. *Journal of Computer Graphics Techniques*, vol. 3, no. 1, 2014.
4. J. Heinly, S. Recker, K. Bensema, J. Porch, & **C. Gribble**. Integer Ray Tracing. *journal of graphics, gpu, & game tools*, vol. 14, no. 4, 2009.
5. **C. Gribble**. Introducing Multithreaded Programming: POSIX Threads and NVIDIA's CUDA. *ASEE Computers in Education Journal*, October-December 2009.
6. **C. Gribble**. Ray Tracing for Undergraduates. *ASEE Computers in Education Journal*, October-December 2008.
7. **C. Gribble**, C. Brownlee, & S. Parker. Practical Global Illumination for Interactive Particle Visualization. *Computers & Graphics*, February 2008.
8. **C. Gribble**, T. Ize, A. Kensler, I. Wald, & S. Parker. A Coherent Grid Traversal Approach to Visualizing Particle-Based Simulation Datasets. *IEEE Transactions on Visualization & Computer Graphics*, July/August 2007.
9. D. DeMarle, **C. Gribble**, S. Boulos, & S. Parker. Memory Sharing for Interactive Ray Tracing on Clusters. *Journal of Parallel Computing*, February 2005.
10. C. Hansen, S. Parker, & **C. Gribble**. So Much Data, So Little Time... *Parallel Computing: Software Technology, Algorithms, Architectures, & Applications*, September 2003.

### **Peer-Reviewed Conference & Symposium Papers**

11. S. Recker, R. Baltrusch, **C. Gribble**, & M. Butkiewicz. HawkEye: Automatic Stitching of Hand-Held LIDAR Scans using Photogrammetry and Structure-from-Motion. In *Coordinate Metrology Systems Conference*, July 2016.
12. **C. Gribble**. Node Culling Multi-Hit BVH Traversal. In *Eurographics Symposium on Rendering (EI&I Track)*, June 2016.
13. **C. Gribble** & J. Amstutz. Effective Parallelization Strategies for Scalable, High Performance Radio Frequency Ray Tracing. In *IEEE High Performance Extreme Computing*, September 2015.
14. S. Recker, **C. Gribble**, M. Shashkov, M. Yezpez, M. Hess-Flores, & K. Joy. Depth Data Assisted Structure-from-Motion Parameter Optimization and Feature Track Correction. In *Applied Imagery Pattern Recognition Workshop*, October 2014.

15. S. Recker, M. Shashkov, M. Hess-Flores, **C. Gribble**, R. Baltrusch, M. Butkiewicz, & K. Joy. Hybrid Photogrammetry Structure-from-Motion Systems for Scene Measurement and Analysis. In *Coordinate Metrology Systems Conference*, July 2014.
16. **C. Gribble**, J. Fisher, D. Eby, E. Quigley, & G. Ludwig. Ray Tracing Visualization Toolkit. In *ACM SIGGRAPH Symposium on Interactive 3D Graphics & Games*, March 2012.
17. **C. Gribble**. Introducing Multithreaded Programming: POSIX Threads and NVIDIA's CUDA. In *2009 ASEE Annual Conference & Exposition*, June 2009.
18. K. Ramani, **C. Gribble**, & A. Davis. StreamRay: A Stream Filtering Architecture for Coherent Ray Tracing. In *Fourteenth International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS '09)*, March 2009.
19. **C. Gribble** & K. Ramani. Coherent Ray Tracing via Stream Filtering. In *IEEE/Eurographics Symposium on Interactive Ray Tracing*, August 2008.
20. **C. Gribble**. Ray Tracing for Undergraduates. In *2008 ASEE Annual Conference & Exposition*, June 2008.
21. **C. Gribble** & S. Parker. Interactive Particle Visualization with Advanced Shading Models using Lazy Evaluation. In *Eurographics Symposium on Parallel Graphics & Visualization*, May 2007.
22. **C. Gribble**, A. Stephens, J. Guilkey, & S. Parker. Visualizing Particle-Based Simulation Data on the Desktop. In *British HCI 2006 Workshop on Combining Visualization & Interaction to Facilitate Scientific Exploration & Discovery*, September 2006.
23. **C. Gribble** & S. Parker. Enhancing Interactive Particle Visualization with Advanced Shading Models. In *ACM SIGGRAPH Third Symposium on Applied Perception in Graphics & Visualization*, July 2006.
24. J. Bigler, J. Guilkey, **C. Gribble**, C. Hansen, & S. Parker. A Case Study: Visualizing Material Point Method Data. In *Eurographics/IEEE-VGTC Symposium on Visualization*, May 2006.
25. D. DeMarle, **C. Gribble**, & S. Parker. Memory-Savvy Distributed Interactive Ray Tracing. In *Eurographics Symposium on Parallel Graphics & Visualization*, June 2004.
26. D. DeMarle, S. Parker, M. Hartner, **C. Gribble**, & C. Hansen. Distributed Interactive Ray Tracing for Large Volume Visualization. In *IEEE Symposium on Parallel Visualization & Graphics*, October 2003.
27. **C. Gribble**, J. Vasak, & J. Welling. A Visualization Subsystem for the PSC TCS. In *IEEE Workshop on Commodity-Based Visualization Clusters*, October 2002.

#### **Peer-Reviewed & Edited Book Chapters**

28. **C. Gribble** & J. Amstutz. Radio Frequency Ray Tracing. In *High Performance Parallelism Pearls, Volume 2*, Jeffers & Reinders, editors, July 2015.
29. **C. Gribble**. Interactive Particle Visualization. In *Trends in Interactive Visualization: State of the Art Survey*, Zudilova-Seinstra, Adriaansen, & van Liere, editors, November 2008.

#### **Trade Journal Articles**

30. S. Recker & **C. Gribble**. Real-Time, In-Situ Intelligent Video Analytics: Harnessing the Power of GPUs for Deep Learning Applications. *DSIAC Journal*, vol. 4, no. 1, 2017.
31. **C. Gribble** & J. Amstutz. StingRay: High-Performance RF Energy Propagation Modeling in Complex Environments. *DSIAC Journal*, vol. 2, no. 2, 2015.
32. J. Amstutz & **C. Gribble**. Leveraging GPUs for Ballistic Simulation. *DSIAC Journal*, vol. 2., no. 1, 2015.

#### **Posters & Extended Abstracts**

33. S. Recker & **C. Gribble**. Sentinel: Real-Time In-Situ Intelligent Video Analytics for Mobile Platforms. In *GPU Technology Conference*, May 2017.

34. J. Amstutz, J. Guenther, I. Wald, & **C. Gribble**. An Evaluation of Existing BVH Traversal Algorithms for Efficient Multi-Hit Ray Tracing. In *ACM SIGGRAPH/Eurographics High Performance Graphics*, July 2015.
35. **C. Gribble** & A. Naveros. GPU Ray Tracing with Rayforce. In *ACM SIGGRAPH 2013 Posters Program*, July 2013.
36. E. Kerzner, C. Wyman, L. Butler, & **C. Gribble**. Toward Accurate and Efficient Order-Independent Transparency. In *ACM SIGGRAPH 2013 Posters Program*, July 2013.
37. L. Butler, **C. Gribble**, & M. Butkiewicz. Visual Simulation Laboratory. In *GPU Technology Conference*, March 2013.
38. A. Naveros & **C. Gribble**. GPU Ray Tracing with Rayforce. In *GPU Technology Conference*, March 2013.
39. K. Shkurko, T. Ize, **C. Gribble**, E. Brunvand, & L. Butler. Simulating Radio Frequency Propagation via Ray Tracing. In *GPU Technology Conference*, March 2013.
40. J. Fisher, D. Eby, E. Quigley, G. Ludwig, & **C. Gribble**. Ray Tracing Visualization Toolkit. In *ACM SIGGRAPH/Eurographics High Performance Graphics*, August 2011.
41. K. Bensema, J. Porch, J. Heinly, S. Recker, & **C. Gribble**. Toward Stream Filtered Ray Tracing on a Digital Signal Processor. In *ACM SIGGRAPH/Eurographics High Performance Graphics*, June 2010.
42. J. Heinly, K. Bensema, & **C. Gribble**. Packet-Based Interactive Ray Tracing with CUDA. In *ACM SIGGRAPH/Eurographics High Performance Graphics*, August 2009.
43. I. Wald, **C. Gribble**, S. Boulos, & A. Kensler. SIMD Ray Stream Tracing. In *IEEE/Eurographics Symposium on Interactive Ray Tracing*, September 2007.
44. **C. Gribble**, T. Ize, A. Kensler, I. Wald, & S. Parker. A Coherent Grid Traversal Approach to Visualizing Particle-Based Simulation Datasets. In *IEEE Symposium on Interactive Ray Tracing*, September 2006.
45. **C. Gribble** & S. Parker. An Experimental Design for Determining the Effects of Illumination Models in Particle Visualization. In *ACM SIGGRAPH Second Symposium on Applied Perception in Graphics & Visualization*, August 2005.

#### **Technical Reports**

46. K. Ramani, **C. Gribble**, & A. Davis. Stream Filtering in StreamRay: An Architecture for Coherent Ray Tracing. *Department of Computer Science, Grove City College, GCC-CS-002-2008*, August 2008.
47. I. Wald, **C. Gribble**, S. Boulos, & A. Kensler. SIMD Ray Stream Tracing: SIMD Ray Traversal with Generalized Ray Packets and On-the-fly Re-Ordering. *Scientific Computing & Imaging Institute, University of Utah, UUSCI-2007-012*, August 2007.
48. **C. Gribble**, S. Parker, & C. Hansen. Interactive Volume Rendering of Large Datasets using the Silicon Graphics Onyx4 Visualization System. *School of Computing, University of Utah, UUSOC-04-003*, January 2004.
49. **C. Gribble**, X. Cavin, M. Hartner, & C. Hansen. Cluster-based Interactive Volume Rendering with Simian. *School of Computing, University of Utah, UUSOC-03-017*, September 2003.
50. **C. Gribble** & S. Parker. A Survey of the Itanium Architecture from a Programmer's Perspective. *Scientific Computing & Imaging Institute, University of Utah, UUSCI-2003-003*, August 2003.

#### **Invited Talks & Presentations:**

1. **C. Gribble**. Implementing Node Culling Multi-Hit BVH Traversal in Embree. *ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games*, May 2018.
2. **C. Gribble**. RckT: Scalable Physically Accurate Rendering in OSPRay. *Intel HPC Developer Conference*, November 2017.
3. **C. Gribble**. Real-Time In-Situ Intelligent Video Analytics for Mobile Platforms. *GPU Technology Conference*, May 2017.



4. **C. Gribble.** Realizing Multi-Hit Ray Tracing in Embree & OSPRay. Intel HPC Developer Conference, November 2016.
5. **C. Gribble.** Real-Time In-Situ Intelligent Video Analytics for Mobile Platforms. GPU Technology Conference Washington D.C., October 2016.
6. **C. Gribble.** High Performance Radio Frequency Ray Tracing with Embree. Intel Parallel Universe Theater, November 2014.
7. **C. Gribble & J. Amstutz.** High Performance Radio Frequency Ray Tracing with Embree. Intel HPC Developer Conference, November 2014.
8. **C. Gribble.** Multi-Hit Ray Traversal. ACM SIGGRAPH Symposium on Interactive 3D Graphics & Games, March 2014.
9. **C. Gribble.** Integer Ray Tracing. In *Ray Tracing is the Future and Ever Will Be...*, ACM SIGGRAPH 2013 Courses Program, July 2013.
10. **C. Gribble & L. Butler.** Advances in High-Performance GPU Ray Tracing for Physics-Based Simulation. GPU Technology Conference, March 2013.
11. **C. Gribble.** Ray State Visualization. US Army Research Laboratory, Aberdeen Proving Ground, March 2012.
12. **C. Gribble.** Stream Filtered Ray Tracing: An Overview & Recent Results. Department of Computer Science, Bucknell University, April 2011.
13. **C. Gribble.** GPU Computing with CUDA: A Hands-On Tutorial. Pittsburgh Perl Workshop, October 2008.
14. **C. Gribble.** Visualization as a Tool for Education & Research. Faculty Scholarship Workshop, Grove City College, February 2007.

### **Research Students:**

#### **Grove City College**

Andrew Claudy Current position:	BS/Computer Science Bentley Systems, Inc.	May 2014
Gideon Ludwig Current position:	BS/Computer Science SURVICE Engineering Company	May 2014
Daniel Eby Current position:	BS/Electrical Engineering Lockheed Martin Corporation	May 2013
Ed Quigley Current program:	BS/Computer Science PhD/Computer Science Stanford University	May 2013
Frank Serra Current program:	BS/Computer Science Agility Business Solutions, Inc.	May 2013
Jeremy Fisher Current position:	BS/Computer Science Bentley Systems, Inc.	May 2012
Matt Mahan Current position:	BS/Mathematics Bentley Systems, Inc.	May 2012
Tyler Anderson Current position:	BS/Computer Science Bechtel Plant Machinery, Inc.	May 2011
Jesse Porch Current position:	BS/Computer Science InterSystems Corporation	May 2011

Shawn Recker	BS/Computer Science	May 2011
Current program:	PhD/Computer Science	
	University of California at Davis	
Kevin Bensema	BS/Computer Science	May 2010
Current program:	PhD/Computer Science	
	University of California at Davis	
Craig Hamilton	BS/Computer Science	May 2010
Current position:	Aesynt, Inc.	
Jared Heinly	BS/Computer Science	May 2010
Current program:	PhD/Computer Science	
	University of North Carolina at Chapel Hill	

### **Teaching Interests:**

Computer graphics & visualization:	Introductory & advanced computer graphics, scientific visualization
High performance computing:	Parallel computing: architectures, algorithms, & applications
Other:	Computer architecture, operating systems, data communications & networking

### **Teaching Experience:**

#### **Grove City College**

<i>Computer Architecture &amp; Organization</i>	Spring semester	2009-2012
<i>Introduction to Computer Graphics</i>	Spring semester	2008-2012
<i>Advanced Programming &amp; Data Structures</i>	Fall & spring semesters	2007-2012
<i>Operating Systems</i>	Spring semester	2007-2012
<i>Object Oriented &amp; Advanced Programming</i>	Fall semester	2008-2011
<i>Computer Programming II</i>	Fall semester	2007-2011
<i>Computer Security</i>	Fall semester	2011
Special topics: <i>Computer Security</i>	Spring semester	2011
<i>Data Communications &amp; Networking</i>	Fall semester	2009-2010
Special topics: <i>Ray Tracing Visualization</i>	Fall semester	2010
Special topics: <i>Interactive Ray Tracing with OptiX</i>	Spring semester	2010
<i>Computer Programming I</i>	Fall & spring semesters	2007-2008
Special topics: <i>Image Synthesis using Ray Tracing</i>	Spring semester	2007-2008
<i>Web Programming Technologies</i>	Spring semester	2007

#### **University of Utah**

Co-instructor, <i>Advanced Computer Graphics II</i>	Spring semester	2006
Assistant instructor, <i>Advanced Computer Graphics II</i>	Spring semester	2005

#### **Carnegie Mellon University**

Teaching assistant, <i>Telecommunication Security</i>	Spring semester	2002
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### **Honors & Awards:**

University of Utah Graduate Research Fellowship Program	Research fellow	2005-2006
School of Computing Outstanding Teaching Assistant Award Program	Honorable mention	2005
Carnegie Mellon University Full Tuition Scholarship for Graduate Studies		2000-2002
NASA Glenn Research Center Collaborative Summer Research Program	Accepted applicant	2001
Grove City College Presidential Scholars List		1999-2000
Grove City College Synod of the Trinity Scholarship		1996-2000
Grove City College Dean's List, with distinction		1996-1999
National Collegiate Mathematics Award		1997
Elks National Foundation 4-year Scholarship for Undergraduate Studies		1996

## Academic & Professional Service:

Grove City College Academic Integrity Student/Faculty Review Committee	Member	2011-2012
Grove City College Linux & Unix User's Group	Faculty advisor	2011-2012
ACM SIGGRAPH Undergraduate Research Alliance	Member	2010-2012
Grove City College Chapter of Sigma Xi, the Scientific Research Society	Vice president	2009-2012
Grove City College Sigma Xi/Swezey Student Research Poster Competition	Co-organizer	2009-2012
Grove City College Campus Technology Committee	Member	2009-2012
Grove City College Biannual Student Research Showcase	Co-organizer	2008-2012
Grove City College Hopeman Student Research Seminar Series	Co-organizer	2008-2012
Grove City College Chapter of the Association for Computing Machinery	Faculty advisor	2008-2012
Center for Vision & Values Working Group on Ethics & Character Formation	Member	2007-2012
ACM SIGGRAPH/Eurographics High Performance Graphics	Publicity chair	2012
ACM SIGGRAPH/Eurographics High Performance Graphics	Program committee	2009-2011
ACM SIGGRAPH/Eurographics High Performance Graphics	Posters chair	2011
ACM SIGGRAPH/Eurographics High Performance Graphics	Program chair	2010
AVI Workshop on Interactive Data Exploration & Knowledge Discovery	Program committee	2010
IEEE/Eurographics Symposium on Interactive Ray Tracing	Program committee	2007-2008
IEEE/Eurographics Symposium on Interactive Ray Tracing	Steering committee	2006-2008
IEEE/Eurographics Symposium on Interactive Ray Tracing	Publicity chair	2008
IEEE Symposium on Interactive Ray Tracing	Posters chair	2006
IEEE Symposium on Interactive Ray Tracing	Co-organizer	2006
Graduate Student Advisory Committee, University of Utah	Chairman	2004-2005
School of Computing Research Day, University of Utah	Director	2005
Graduate Student Advisory Committee, University of Utah	Student representative	2003-2004
Incoming Graduate Student Working Group, University of Utah	Student representative	2004
IEEE Visualization conference series	Student volunteer	2002-2003
ACM/IEEE Supercomputing conference series	Student volunteer	2003
Information Networking Symposium, Carnegie Mellon University	Director	2002
B.Y.T.E. Computer Science Honor Society, Grove City College	President	1999
Interfraternity Council, Grove City College	President	1999
Pan Sophic Fraternity, Grove City College	Rush chairman	1998
Pan Sophic Fraternity, Grove City College	Treasurer	1998

## Professional Memberships:

Association for Computing Machinery		2002-2003, 2011-present
ACM Special Interest Group on Graphics and Interactive Techniques		2007-present
Sigma Xi, the Scientific Research Society		2007-present
Institute for Electrical & Electronics Engineers		2003-present
Council on Undergraduate Research		2009-2012
American Society for Engineering Education		2007-2012
Beta Tau Upsilon Epsilon, Grove City College Computer Science Honor Society		1998-2000
Kappa Mu Epsilon, National Mathematics Honor Society		1998

## Reviews & Panels:

### **Journals**

journal of graphics, gpu, & game tools	Reviewer	2012
Computer Graphics Forum	Reviewer	2012-2014
Computer Methods and Programs in Biomedicine	Reviewer	2012

### **Conferences & Symposia**

ACM SIGGRAPH/Eurographics High Performance Graphics	Reviewer	2009-2011, 2013-2014, 2016, 2018
American Society for Engineering Education, North Central Section	Reviewer	2007-2008, 2010-2012
IEEE Visualization conference series	Reviewer	2005, 2007-2010
Graphics Interface	Reviewer	2010
Eurographics conference series	Reviewer	2005-2006, 2008-2009

SIGGRAPH Asia	Reviewer	2009
IEEE/Eurographics Symposium on Interactive Ray Tracing	Reviewer	2006-2008
Eurographics Symposium on Rendering	Reviewer	2004
IASTED Computer Graphics & Imaging	Reviewer	2004
<b>Panels</b>		
National Science Foundation, CRI-07 Knowledge Discovery	Panelist	2007
<b>Other</b>		
CUR Posters on the Hill, Mathematics/Computer Science Division	Reviewer	2011
Allegheny College Forty Day Visual Feast Project	Reviewer	2010