

Jonathan D. Cohen

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EDUCATION

Ph.D. in Computer Science, 1998. University of North Carolina at Chapel Hill.

“Appearance-Preserving Simplification of Polygonal Models.”

Advisor: Dinesh Manocha.

MS in Computer Science, 1994. University of North Carolina at Chapel Hill.

BA in Computer Science, BA in Music, 1991. Duke University (Magna Cum Laude).

PROFESSIONAL EXPERIENCE

- 1998 - Present **Assistant Professor**, The Johns Hopkins University, Department of Computer Science
Research interests include high-performance rendering of polygonal and volumetric models, virtual environments, parallel graphics architectures, 3D scanning, and collision detection. Courses taught include Projects in Multimedia and Computer Graphics, Rendering Techniques, Virtual Worlds, Computer Graphics Seminar, and Data Structures.
- 1995 – 1998 **Research Assistant - Walkthrough Research Group**, University of North Carolina at Chapel Hill, Department of Computer Science
Conducted research on the automatic simplification of complex, polygonal models. Designed and implemented a walkthrough system for massive models, integrating several rendering acceleration techniques into a single framework. Managed programming efforts for translation among many 3D file formats.
- 1992 – 1995 **Research Assistant - Pixel-Planes Research Group**, University of North Carolina at Chapel Hill, Department of Computer Science
Developed OpenGL-like application programmer's interface for Pixel-Flow. Implemented a single field-time latency rendering system on Pixel-Planes 5. Ported the Graphics Performance Committee's Picture-Level Benchmark software to Pixel-Planes 5, which received the highest PLB score ever recorded for the head benchmark. Implemented an event recorder for measuring performance on Pixel-Planes 5. Developed software interface to a Dynair video switch. Assisted in the development of software for Pixel-Planes 5 by other research groups.

RESEARCH GRANTS

- 2005-2008 Adaptive Simplification of Geometric Models and Shaders
PI. NSF CSR-AES. \$800K (PENDING)
with Marc Olano (UMBC)
- 2003-2006 A Level of Detail Approach to Cluster-based Visualization
PI. DOE Early Career. \$300K
- 2003-2006 MHD Turbulence in Black Hole Accretion: A Testbed for Interactive Visualization of Large 3D Datasets
Co-PI. NSF ITR Small. \$500K
with Julian Krolik (Physics and Astronomy) and Subodh Kumar (Computer Science)
- 2002-2005 Digital Hammurabi: High-Resolution 3D Imaging of Cuneiform Tablets
PI. NSF ITR Medium. \$1.6M.
with Subodh Kumar (Computer Science) and Jerry Cooper (Near Eastern Studies)
(also received a supplemental for Research Experience for Undergraduates)

AWARDS

- 2004 IEEE Visualization Best Poster Award (out of 35) - "On the Visualization of Time-Varying Structured Grids Using a 3D Warp Texture."
- 2003 IEEE Visualization Best Poster Award (out of 33) - "GLOD: A Geometric Level of Detail System at the OpenGL API Level."
- 2003 Department of Energy Early Career Award
- 1998 UNC Graduate School On-Campus Dissertation Award
- 1995 - 1996 Link Foundation Fellowship in Advanced Simulation and Training

EXTERNAL COMMITTEE SERVICE

- 2006 **Conference Chair**, ACM Symposium on Interactive 3D Graphics
- 2005 **Program Committee**, IEEE Visualization
- 2005 **Program Committee**, Pacific Conference on Computer Graphics and Applications
- 2005 **Program Committee**, ACM Symposium on Interactive 3D Graphics
- 2005 **Papers Committee**, ACM Symposium on Computer Animation
- 2004 **Steering Committee**, ACM Symposium on Interactive 3D Graphics
- 2004 **Papers Committee**, ACM Symposium on Computer Animation
- 2003 **Steering Committee**, ACM Symposium on Interactive 3D Graphics
- 2003 **Papers Committee**, ACM Symposium on Computer Animation
- 2001 **Video Review Committee**, ACM Symposium on Computational Geometry

UNIVERSITY COMMITTEE SERVICE

- 2005 **Member**, JHU Computer Science Graduate Admissions Committee
- 2004 **Member**, JHU Whiting School of Engineering Graduate Committee
- 2004 **Member**, JHU Computer Science Graduate Admissions Committee
- 2003 **Member**, JHU Whiting School of Engineering Graduate Committee
- 2003 **Chair**, JHU Computer Science Graduate Admissions Committee
- 2002 **Member**, JHU Whiting School of Engineering Graduate Committee
- 2002 **Member**, JHU Computer Science Graduate Admissions Committee
- 1999 **Member**, JHU Computer Science Infrastructure Committee
- 1998 **Member**, JHU Computer Science Infrastructure Committee

PUBLICLY AVAILABLE SOFTWARE SYSTEMS

- GLOD** (initial release 2003): Library supporting geometric level of detail for use with the popular OpenGL API for interactive rendering, providing a variety of hierarchy building and management algorithms.
- Gusto** (initial release 2002): System for interactive, hierarchical rendering of large (out-of-core) 3D scalar fields, including unstructured grids, structured grids, and voxels.
- V-Collide** (initial release 1997): Library for performing collision queries for real-time applications of thousands of moving polygonal objects (more general than I-Collide).
- Simplification Envelopes** (initial release 1996): Program and tools for automatic generation of "levels of detail" of 3D polygonal models.
- I-Collide** (initial release 1995): Library for performing collision queries for real-time applications of thousands of moving convex polyhedra

BOOK

1. Luebke, David, Martin Reddy, Jonathan D. Cohen, Amitabh Varshney, Benjamin Watson, and Robert Huebner. *Level of Detail for 3D Graphics*. Morgan Kaufmann Publishing, 2002. 390 pages. (soon to appear in Japanese translation)

BOOK CHAPTERS

2. Cohen, Jonathan D. and Dinesh Manocha. "Model Simplification for Interactive Visualization." *Visualization Handbook*. 13 pages. Eds. Chris Johnson and Chuck Hansen. Elsevier Butterworth-Heinemann. Chapter 20, pp. 393-410. 2005. (invited submission)
3. Lin, Min, Dinesh Manocha, Jonathan Cohen and Stefan Gottschalk. "Collision Detection: Algorithms and Applications" *Proceedings of Algorithms for Robotics Motion and Manipulation*. pp. 129-142. eds. Jean-Paul Laumond and M. Overmars, A.K. Peters (invited submission)

CONFERENCE AND JOURNAL PUBLICATIONS (PEER-REVIEWED , FULL-LENGTH PAPERS)

(available from <http://www.cs.jhu.edu/~cohen/publications.html>)

4. Chhugani, Jatin, Budi Purnomo, Shankar Krishnan, Jonathan D. Cohen, Suresh Venkatasubramanian, David Johnson, Subodh Kumar. "vLOD: A System for High Fidelity Walkthroughs of Very Large Virtual Environments." *IEEE Transactions on Visualization and Computer Graphics*. 11 (1). January 2005. pp. 35-47.
5. Cohen, Jonathan, Dean Snyder, Donald Duncan, Jerrold Cooper, Subodh Kumar, Daniel Hahn, Yuan Chen, Budirijanto Purnomo, and John Graettinger. "iClay: Digitizing Cuneiform". *Proceedings of 5th International Eurographics Symposium on Virtual Reality, Archaeology, and Cultural Heritage*. pp. 135-143. 2004.
6. Purnomo, Budirijanto, Jonathan Cohen, and Subodh Kumar. "Seamless Texture Atlases" *Proceedings of 2nd Eurographics/ACM Symposium on Geometry Processing*, pp. 67-76. 2004. (acceptance rate: 29%)
7. Cohen, Jonathan, Dinesh Manocha, and Marc Olano. "Successive Mappings: An Approach to Polygonal Mesh Simplification with Guaranteed Error Bounds." *International Journal of Computational Geometry and Applications*. 13 (1). February 2003. pp. 61-94.
8. Kumar, Subodh, Dean Snyder, Donald Duncan, Jonathan Cohen, and Jerry Cooper. "Digital Preservation of Ancient Cuneiform Tablets Using 3D-Scanning." *Proceedings of Fourth International Conference on 3D Digital Imaging and Modeling*. pp. 326-333. 2003. (selected for cover image) (acceptance rate: 40%)
9. Chhugani, Jatin, Sudhir Vishwanath, Jonathan Cohen, and Subodh Kumar. ISOSLIDER: A System for Interactive Exploration of Isosurfaces. *Proceedings of the Joint Eurographics - IEEE TCVG Symposium on Visualization (VisSym 2003)*. pp. 259-266. 2003. (acceptance rate: 48%)
10. Williams, Nathaniel, Michael Kelly, Brendon Schubert, David Luebke, and Jonathan Cohen. "Perceptually Guided Simplification of Lit, Textured Meshes." *Proceedings of 2003 ACM Symposium on Interactive 3D Graphics*. pp. 113-121. (selected for cover image) (acceptance rate: 26%)
11. Levin, Joshua, Jason Corso, Jonathan D. Cohen and Subodh Kumar. "Interactive Visualization of Unstructured Grids Using Hierarchical 3D Textures." *Proceedings of IEEE/SIGGRAPH Symposium on Volume Visualization and Graphics 2002*. pp. 37-44. (selected for cover image) (acceptance rate: 44%)
12. Cohen, Jonathan D., Daniel Aliaga, and Weiqiang Zhang. "Hybrid Simplification: Combining Multi-resolution Polygon and Point Rendering." *Proceedings of IEEE Visualization 2001*. pp. 37-44 and 539. (acceptance rate: 34%)
13. Hunter, Adam, and Jonathan D. Cohen. "Uniform Frequency Images: Adding Geometry to Images to Produce Space-Efficient Textures." *Proceedings of IEEE Visualization 2000*. pp. 243-250 and 563. (acceptance rate: 34%)
14. Aliaga, Daniel, Jonathan Cohen, Andrew Wilson, Eric Baker, Hansong Zhang, Carl Erikson, Kenneth Hoff, Thomas Hudson, Wolfgang Stuerzlinger, Rui Bastos, Mary Whitton, Frederick Brooks, and Dinesh Manocha. "MMR: An Interactive Massive Model Rendering System using Geometric and Image-based Acceleration." *Proceedings of the 1999 ACM Symposium on Interactive 3D Graphics*, pp. 199-206 and 237. (acceptance rate: 25%)
15. Cohen, Jonathan, Marc Olano, and Dinesh Manocha. "Appearance-Preserving Simplification." *Proceedings of SIGGRAPH 98*. (Orlando, FL, July 19-24, 1998). pp. 115-122. (acceptance rate: 15%)
16. Cohen, Jonathan, Dinesh Manocha, and Marc Olano. "Simplifying Polygonal Models Using Successive Mappings." *Proceedings of IEEE Visualization '97*. pp. 395-402, and 564. (acceptance rate: 26%)

17. Hudson, Thomas C., Ming Lin, Jonathan Cohen, Stefan Gottschalk, and Dinesh Manocha. "V-Collide: Accelerated Collision Detection for VRML." *Proceedings of VRML '97*. pp. 117-123.
18. Hudson, Thomas, Dinesh Manocha, Jonathan Cohen, Ming Lin, Kenneth Hoff, and Hansong Zhang. "Accelerated Occlusion Culling Using Shadow Frusta." *Proceedings of the Thirteenth Annual Symposium on Computational Geometry*. pp. 1-10. 1997. (acceptance rate: 38%)
19. Cohen, Jonathan, Amitabh Varshney, Dinesh Manocha, Greg Turk, Hans Weber, Pankaj Agarwal, Frederick Brooks, and William Wright. "Simplification Envelopes." *Proceedings of SIGGRAPH 96* (New Orleans, LA, August 4-9, 1996). pp. 119-128. (acceptance rate: 15%)
20. Olano, Marc, Jon Cohen, Mark Mine, Gary Bishop. "Combatting Rendering Latency." *Proceedings of the 1995 Symposium on Interactive 3D Graphics* (Monterey, CA, April 9-12, 1995). pp. 19-24 and 204. (acceptance rate 34%)
21. Cohen, Jonathan D., Ming C. Lin, Dinesh Manocha, and Madhav K. Ponamgi. "I-COLLIDE: an Interactive and Exact Collision Detection System for Large Scale Environments." *Proceedings of the ACM Symposium on Interactive 3D Graphics*, pp. 189-196, 1995. (acceptance rate 34%)

OTHER PUBLICATIONS AND REPORTS

22. Chen, Yuan, Jonathan D. Cohen, and Subodh Kumar. "On the Visualization of Time-Varying Structured Grids Using a 3D Warp Texture." IEEE Visualization 2004 Poster and Interactive Demo. pp. 107-108. (received *Best Poster Award* out of 35 accepted posters).
23. Cohen, Jonathan D., David Luebke, Nathaniel Duca, Brenden Schubert, and Chris Niski. "GLOD: A Minimal Interface for Geometric Level of Detail". 10 pages. Johns Hopkins University Graphics Lab Technical Report. 2004.
24. Cohen, Jonathan D., David Luebke, Nathaniel Duca, and Brenden Schubert. "GLOD: A Geometric Level of Detail System at the OpenGL API Level." IEEE Visualization 2003 Poster (2 pages). (received *Best Poster Award* out of 32 accepted posters).
25. Cohen, Jonathan D., David Luebke, Nathaniel Duca, and Brenden Schubert. "GLOD: A Driver-Level Interface for Geometric Level of Detail." SIGGRAPH 2003 Technical Sketch.
26. Cohen, Jonathan D., David Luebke, Nathaniel Duca, and Brenden Schubert. "GLOD: Level of Detail for the Masses." Johns Hopkins University Graphics Lab Technical Report. 2003.
27. Cohen, Jonathan D., Isosurface Extraction on Graphics Hardware. Johns Hopkins University Graphics Lab Technical Report. 2003.
28. Cohen, Jonathan. "GeomLOD: Geometric Level of Detail for OpenGL. Johns Hopkins University Graphics Lab Technical Report. 2002.
29. Cohen, Jonathan. "Concepts and Algorithms for Polygonal Simplification." SIGGRAPH 99 Course Tutorial #20: Interactive Walkthroughs of Large Geometric Datasets. pp. C1-C34. 1999. also in SIGGRAPH 2000 Course Tutorial.
30. Aliaga, Daniel, Jonathan Cohen, Andrew Wilson, Hansong Zhang, Carl Erikson, Kenneth Hoff, Thomas Hudson, Wolfgang Stuerzlinger, Eric Baker, Rui Bastos, Mary Whitton, Frederick Brooks, and Dinesh Manocha. "A Framework for the Real-time Walkthrough of Massive Models." UNC Computer Science Technical Report 98-013. 1998.
31. Cohen, Jonathan. "Appearance-Preserving Simplification of Polygonal Models." Ph.D. Dissertation. University of North Carolina at Chapel Hill. 1998.
32. Cohen, Jonathan D., Dinesh Manocha, and Marc Olano. "Simplification of Polygonal Models Using Successive Mappings." 2nd CGC Workshop on Computational Geometry. 1997.
33. Cohen, Jonathan, Amitabh Varshney, and Dinesh Manocha. "Efficient Model Simplification with Global Error Bounds." Fifth MSI-Stony Brook Workshop on Computational Geometry. pp. 43-44. 1995.
34. Cohen, Jonathan D., Ming C. Lin, Dinesh Manocha, Madhav K. Ponamgi. "Collision Detection for Interactive Environments." *The 3rd Annual Video Review of Computational Geometry*. 1994.

TALKS AND DEMONSTRATIONS PRESENTED

- “iClay: Digitizing Cuneiform.” 5th International Eurographics Symposium on Virtual Reality, Archaeology, and Cultural Heritage, Brussels, Belgium. 2004.
- “Visualization of Time-Varying Structured Grids Using a 3D Warp Texture”
IEEE Visualization 2004, Austin, TX
- “GLOD: A Driver-Level Interface for Geometric Level of Detail.”
SIGGRAPH 2003, San Diego, CA.
IEEE Visualization 2003, Seattle, WA. (received *Best Poster Award* out of 32 accepted posters)
- “Measuring Simplification Error.” Advanced Level of Detail for Dynamic Fidelity Control.
Game Developers Conference 2003.
SIGGRAPH 2002, San Antonio, TX, 2002.
SIGGRAPH 2001, Los Angeles, CA, 2001
SIGGRAPH 2000, New Orleans, LA. 2000
IEEE Virtual Reality 2000, New Brunswick, NJ, 2000.
- “Hybrid Simplification.” IEEE Visualization 2001, San Diego, CA. 2001.
- “Approaches to Polygonal Model Simplification.” Interactive Walkthroughs of Large Geometric Datasets.
Solid Modeling 2001, Ann Arbor, MI. 2001.
SIGGRAPH 2000, New Orleans, LA. 2000
SIGGRAPH 99 Course #20, Los Angeles, CA. 1999.
- “Appearance-Preserving Simplification.” SIGGRAPH 98, Orlando, FL, 1998.
- “Simplification of Polygonal Models Using Successive Mappings.”
Visualization '97, Phoenix, AZ. 1997
Second CGC Workshop on Computational Geometry, Durham, NC. 1997.
- “Collision Detection: Algorithms and Implementations.” Interactive Walk-Through of Complex Environments.
SIGGRAPH 97 Course, Los Angeles, CA. 1997.
- “Combatting Rendering Latency.” ACM Symposium on Interactive 3D Graphics, Monterey, CA. 1995.
- “Simplification Envelopes.” SIGGRAPH 96, New Orleans, LA. 1996.
- “Efficient Model Simplification with Global Error Bounds.” Fifth MSI-Stony Brook Workshop on Computational Geometry, Stony Brook, NY. 1995.

REFEREE FOR

Conferences

ACM SIGGRAPH (1996-2004), ACM Symposium on Computational Geometry (1997), ACM Symposium on Computational Geometry Video Review Committee (2001), ACM Symposium on Computer Animation (2003-2004), ACM Symposium on Interactive 3D Graphics (1997, 1999, 2001, 2003, 2005), Computer Graphics International (1996), Eurographics (2002), Eurographics Rendering Workshop (2002), Graphics Interface (1999-2000, 2003, 2005), IEEE International Conference on Multimedia (2002), IEEE Visualization (1997, 2000-2004), IEEE VRAIS (1996), IEEE Workshop on Parallel Visualization and Graphics (2003), Solid Modeling (1999)

Journals

Graphical Models, Computer-Aided Design, Computers and Graphics, IEEE Computer Graphics and Applications, IEEE Transactions on Medical Imaging, IEEE Transactions on Robotics and Automation, IEEE Transactions on Visualization and Computer Graphics, Journal of Graphics Tools, The Visual Computer

TEACHING EXPERIENCE

(independent study courses are included with student research supervision)

- Fall 2004 **CS 600.226 – Data Structures**
Topics include object-oriented design, algorithm analysis, stacks, queues, lists, containers, sequences, trees, priority queues, dictionaries, sorting, and graphs. Students incrementally implement the Turtle Commander, a turtle graphics package for drawing colored lines including features such as pushing and popping drawing state, undo/redo, flood filling, named macros, and fonts.
- Fall 2004 **CS 600.757 – Computer Graphics Seminar**
Topic: Parameterization and Mesh Editing
- Spring 2004 **CS 600.359 – Projects in Multimedia and Computer Graphics: Visualization**
Undergraduate project course involving three separate visualization challenges: visualization of data from the Sloan Digital Sky survey, 3D vector field visualization of simulated active galactic nuclei, and foreground object removal from video streams gathered from a free-moving camera.
- Spring 2004 **CS 600.757 – Computer Graphics Seminar**
Topic: “Computer Graphics: Then and Now”
- Fall 2003 **CS 600.226 – Data Structures**
- Fall 2003 **CS 600.757 – Computer Graphics Seminar**
Topic: Vector Field Visualization
- Spring 2003 **CS 600.356/456 – Rendering Techniques**
Topics include light, color, and color spaces, local illumination models, global illumination, ray tracing, radiosity computation, volume rendering, image-based rendering, 3D image warping, light fields, procedural and image-based texturing and shading, non-photorealistic rendering, and parallel rendering. Students implement object-oriented ray tracers. Upper level course students also design, implement, and present a personal project as well as presenting a relevant research paper.
- Spring 2003 **CS 600.757 – Computer Graphics Seminar**
Topic: Surface Reconstruction
- Fall 2002 **CS 600.226 – Data Structures**
- Fall 2002 **CS 600.757 – Computer Graphics Seminar**
Topic: Level Sets and Related Topics
- Spring 2002 **CS 600.359 – Projects in Multimedia and Computer Graphics: Video Triptik**
Project course involving construction of video database of the Johns Hopkins Campus and querying the database to produce customized video paths. Undergraduate students collaborate to build a single large-scale system combining GPS, video processing, and web services.
- Spring 2002 **CS 600.757 – Computer Graphics Seminar**
Topic: Texturing and Applications
- Fall 2001 **CS 600.226 – Data Structures**
- Fall 2001 **CS 600.757 – Computer Graphics Seminar**
Topic: New Representations for Computer Graphics
- Spring 2001 **CS 600.226 – Data Structures**
- Spring 2001 **CS 600.757 – Computer Graphics Seminar**
Topic: Out-of-core and Large-scale Scientific Visualization
- Fall 2000 **CS 600.456 – Rendering Techniques**
- Fall 2000 **CS 600.757 – Computer Graphics Seminar**
Topic: Subdivision Surfaces

- Spring 2000 **CS 600.460 – Virtual Worlds**
Topics include history of virtual environments, advanced raster graphics architecture, head-mounted and other 3D display systems, tracking, haptics and force feedback, rendering speedup, model building, interaction techniques, physical simulation, human perception and human factors, and augmented reality, as well as applications to telecollaboration, medicine, molecular modeling, scientific visualization, architectural walkthrough, computer-aided design and manufacturing, and entertainment.
- Spring 2000 **CS 600.757 – Computer Graphics Seminar**
Topic: Image-based and Mixed-Mode Rendering
- Fall 1999 **CS 600.456 – Rendering Techniques**
- Spring 1999 **CS 600.460 – Virtual Worlds**
- Fall 1998 **CS 600.456 – Rendering Techniques**
- Summer 1996 **COMP 14 - Introduction to Computer Programming** (at UNC-Chapel Hill)

PHD ADVISEES

Jonathan Bilodeau (in progress)

Yuan Chen (in progress)

Chris Niski (in progress)

Budi Purnomo (in progress)

PHD COMMITTEES

Joseph Hennessey (expected 2005) – *Interactive Volume Visualization on a Heterogeneous Network of Computers*

Jatin Chhugani, PhD 2004 (reader) – *High Fidelity Walkthroughs of Large Virtual Environments*

Andrew Lundberg, PhD 2000 (reader) – *Physically Derived Geometric Models for Polarized Reflection and Emission from Rough Surfaces*

PHD QUALIFIER PROJECTS SUPERVISED

Ofri Sadowski – *Direct Visualization of Digitally Reconstructed Radiographs on Graphics Hardware* (2004)

Jonathan Bilodeau – *Packed Vertex Compression for Graphics Hardware* (2004)

Yuan Chen – *Hardware-Accelerated Visualization of Time-Varying Structured Grids* (2004)

Budi Purnomo – *Out-of-core Clustering of Triangle Meshes* (2003)

Jason Corso – *Hierarchical Voxelization of Unstructured Grids* (2003) – published in *Proceedings of IEEE/SIGGRAPH Symposium on Volume Visualization and Graphics 2002*

Ankur Bhargava – *Hierarchical Light Field Compression* (2002)

Joseph Hennessey – *Volume Rendering Using a Hierarchical Light Field Cache* (2002)

Wenjing Huang – *Computer-based Design and Rendering of Chinese Thread Art* (2001)

Guoxing Wang – *Interactive Adaptive Subdivision Surface Rendering* (2001)

Weiqiang Zhang – *Hybrid Simplification* (2001) – published in *Proceedings of IEEE Visualization 2001*

Adam Hunter – *Uniform Frequency Images* (2000) – published in *Proceedings of IEEE Visualization 2000*

MS STUDENT RESEARCH PROJECTS SUPERVISED

David Ko – *Real-time Painterly Rendering* (2001)

Joanna Lee – *Real-time 3D Reconstruction from MRI Image Pairs of Cardiac Catheter* (1999) (with Department of Biomedical Engineering)

BS STUDENT RESEARCH PROJECTS SUPERVISED

Gil Birman – *Maniakil: A Human-Guided Physical Avatar* (2003)

Chris Weiler – *Interactive Visualization of Caustics* (2003)

Siddharth Sonrexa – *A Spline-based Transfer Function Editor for Volume Visualization* (2003)

Edmund Dorsey – *Simulation and Rendering of Dynamic Grassy Environments* (2002)

Nathaniel Duca – *A Stream-caching Approach to Polygonal Simplification* (2002)

Joshua Leven – *Interactive Visualization Using Hierarchical 3D Textures* (2002) – published in *Proceedings of IEEE/SIGGRAPH Symposium on Volume Visualization and Graphics 2002*

Joshua Leven, Edmund Dorsey, and Daniel Stephenson – *A Game Engine for Interactive 3D Graphics* (2001)

Eric Musgrave – *Visualization of Outdoor Environments Using Texture Impostors* (1999)