

PAUL ARTHUR NAVRÁTIL

8101 Parkdale Drive
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(512) 796 - 9020
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EDUCATION

Ph.D. Computer Science, University of Texas at Austin, expected Spring/Summer 2008

M.S. Computer Science, University of Texas at Austin, 2006

B.S. Computer Science with honors, University of Texas at Austin, 1999
special honors in Computer Science

B.A. Plan II with honors, University of Texas at Austin, 1999
Dean's distinguished graduate in Liberal Arts
Plan II Model Thesis award

AREAS OF INTEREST

- real-time rendering and visualization
- parallel systems, especially single-chip architectures
- acceleration structures for ray tracing
- global illumination
- geometric simplification / level of detail (LOD) selection
- compiler-driven optimizations

RELEVANT SKILLS / COURSEWORK

- graduate computer graphics (prof: Don Fussell)
- real-time graphics systems (prof: Bill Mark)
- high-performance ray tracing for dynamic scenes (profs: Fussell and Mark)

proficient in

- C, C++, Java

working knowledge of

- Perl, Python, OpenGL, VTK, Microsoft Visual Studio IDE, Microsoft Foundation Classes (MFC), Unix shell scripting

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EMPLOYMENT HISTORY

Visualization Scientist – Texas Advanced Computing Center (2007 – present)

- developing scientific visualizations and visualization technology (2007 – present, supervisor: Gregory S. Johnson)
 - lead for primary remote and interactive visualization system
 - developing visualization techniques for petascale scientific computing systems

Graduate Intern Technical – Intel Corporation (summer 2006)

- studied performance characteristics of real-time ray tracers (summer 2006, supervisor: James Hurley)
 - instrumented two state-of-the-art ray tracers to measure performance characteristics and opportunities for optimization
 - investigated integrating novel algorithm for coherent processing of secondary rays with existing real-time ray tracing system

Graduate Research Assistant – Los Alamos National Laboratory (summer 2005)

- investigated cache-efficient ray tracing methods for direct volume visualization (summer 2005, supervisor: Allen McPherson)
 - developed optimized ray tracer to perform direct volume visualization
 - measured performance of several ray traversal algorithm to determine most suitable method for direct volume visualization

Graduate Research Assistant – University of Texas at Austin (2001 – 2007)

- developing scientific visualizations and visualization technology (2006 – 2007, supervisor: Romy Schneider, Texas Advanced Computing Center)
 - developed localized interpolation technique for cosmological point-based datasets to facilitate isosurface extraction and visualization
 - visualizations published in International Science Grid This Week, The Alcalde
- investigating cache-efficient ray tracing methods for current-generation hardware (2003 - 2006, supervising professor: Bill Mark, with Don Fussell and Calvin Lin)
 - developed novel ray traversal algorithm to yield superior cache utilization
 - implemented framework to study cache performance of acceleration structures
 - developed equations to predict cache behavior of ray traversal
- investigated compiler assisted optimizations and error detection for OpenGL library (2002 - 2003, supervising professor: Calvin Lin)
 - developed semantic error checking on OpenGL applications and potential library specific-optimizations to OpenGL-based application code using research compiler and user-supplied semantic annotations for library functions

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EMPLOYMENT HISTORY (continued)

Graduate Research Assistant – University of Texas at Austin (2001 – 2007)

- investigated representing event probability in a conceptual knowledge system (2001 - 2002, supervising professor: Bruce Porter)
 - attempted to add the syntax and semantics for probability to a component-based knowledge system
 - developed representations of concepts from cell synthesis in a component-based knowledge system (a system where complex concepts are built from simpler concepts)

Software Engineer – Liaison Technology, Inc. (1999 – 2001)

- co-developed patented algorithm and core algorithm code for data-mining semi-structured data
- code formed core of two product lines through multiple release cycles
- lead engineer on multiple critical-path product features
- lead technical contact for business development and sales

Lab Research Assistant II – Applied Research Laboratories (1997-1998)

- enhanced existing data-mining prototype to improve acquisition of semi-structured data
- developed graphical user interface (GUI) for prototype

PATENTS

U.S. 6,782,505: Method and system for generating structured data from semi-structured data sources. Dan Miranker, Lance Obermeyer, Paul Navrátil. issued August 24, 2004.

PUBLICATIONS

Paul Arthur Navrátil, Donald S. Fussell and Calvin Lin. Dynamic Ray Scheduling to Improve Ray Coherence and Bandwidth Utilization. IEEE / EG Symposium on Interactive Ray Tracing 2007.

Paul Arthur Navrátil, Jarrett L. Johnson and Volker Bromm. Visualization of Cosmological Particle-Based Datasets. IEEE Transactions on Visualization and Computer Graphics (Proceedings of IEEE Visualization 2007), Nov / Dec, 2007.

Paul Arthur Navrátil, Donald S. Fussell and Calvin Lin. Dynamic Ray Scheduling for Improved System Performance. The University of Texas at Austin, Department of Computer Sciences. Technical Report TR-07-19.

Paul Arthur Navrátil, Jarrett L. Johnson and Volker Bromm. Visualization of Cosmological Point-Based Datasets. The University of Texas at Austin, Department of Computer Sciences. Technical Report TR-07-16.

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PUBLICATIONS (continued)

Paul Arthur Navrátil and William R. Mark. An Analysis of Raytracing Bandwidth Consumption. The University of Texas at Austin, Department of Computer Sciences. Technical Report TR-06-40.

Bruce Porter, Ken Barker, James Fan, Paul Navrátil, Dan Tecuci, Peter Yeh and Peter Clark. "Mining Answers from Texts and Knowledge Bases: Our Position." Mining Answers from Texts and Knowledge Bases: Papers from the 2002 AAI Spring Symposium (TR SS-02-06), Sanda M. Harabagiu and Vinay Chaudhri, ed. pp 80 - 81.

Paul Arthur Navrátil. "TeamTexas: a Simulator Team for RoboCup 1998", Proceedings of the Second RoboCup Workshop, Minoru Asada, ed. pp. 373 - 377.