

William Valentine Baxter III

CONTACT

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GOAL

I am looking for a position near Tokyo, Japan where I can combine my technical abilities and research skills with creativity and hard work to further the state of the art in 3D graphics or bring exciting new graphics technologies into the world. I am particularly interested in working on areas related to digital content creation: digital painting, modeling, animation, or rendering.

EDUCATION

University of North Carolina at Chapel Hill

- Ph.D. in Computer Science, September 2004
(Dissertation on realistic interactive simulation of paint)
- M.S. in Computer Science, December 2000
- Cumulative GPA "4.0" (all H, in H/P/L system)

Yale University, New Haven, CT

- B.S. in E.E., June 1995.
- 3.7 GPA

PUBLICATIONS

- Baxter, William V., "Physically-based Modeling Techniques for Interactive Digital Painting", Ph.D. Dissertation, University of North Carolina at Chapel Hill, defended Sept 3, 2004.
- Baxter and Lin, "A Versatile Interactive 3D Brush Model", to appear in the Proceedings of Pacific Graphics 2004, October 2004. (<http://gamma.cs.unc.edu/brush>)
- Baxter, Liu, and Lin, "A Viscous Paint Model For Interactive Applications", Computer Animation and Virtual Worlds Journal, 15(3-4):433-442, July 2004.
- Baxter, Liu, and Lin, "A Viscous Paint Model For Interactive Applications", Sketch presented at SIGGRAPH 2004, August 2004.
- Baxter, Wendt, and Lin, "IMPaSTo: A Realistic, Interactive Model for Paint", in Proceedings of the Symposium on Non-Photorealistic Animation and Rendering, June 2004, pp. 45-56.
- Baxter and Lin, "Haptic Interaction With Fluid Media", in the Proceedings of Graphics Interface 2004, May 2004, pp. 81-88.
- Baxter, "A Physically Based Modeling Approach to Interactive Digital Painting", to appear in *Energy, Simulation Training, Ocean Engineering, and Instrumentation, Research Papers of the Link Foundation Fellows*. Ed. Brian Thompson. New York, University of Rochester Press, 2004.
- Baxter, Scheib, Lin and Manocha, "DAB: Interactive Haptic Painting with 3D Virtual Brushes", SIGGRAPH 2001, pp 461-468. (The paper's video also appeared in the Animation Theater).
- Baxter, Sud, Govindaraju, and Manocha, "GigaWalk: Interactive Walkthrough of Complex Environments", Proceedings of the 13th Eurographics Workshop on Rendering Techniques, pp. 203-214, June 2002.
- Baxter and Giovinco, "Rasterization of Lines in a Cylindrical Voxel Grid", US Patent 6,489,961, issued December 3, 2002. (Patent also issued in Taiwan in 2004)
- Sections on paint simulation and brush modeling to appear in upcoming 2nd Edition of *Non-Photorealistic Rendering*, A.K. Peters, Ltd. Bruce Gooch, Amy Gooch, and Mario Sousa, Eds.
- Lin, Baxter, Scheib, and Wendt, "Physically Based Virtual Painting", Communications of the ACM, 47(8):40-47, August 2004.
- Mark Harris, William Baxter, Thorsten Scheuermann, Anselmo Lastra. "Simulation of Cloud Dynamics on Graphics Hardware", Proceedings of Graphics Hardware 2003.
- Lin, Baxter, Foskey, Otaduy and Scheib, "Haptic Interaction for Creative Processes with Simulated Media", Proc. of IEEE Conf. on Robotics and Automation, pp 598-604, May 2002.
- Erikson, Manocha, Baxter, "HLODs for Faster Display of Large Static and Dynamic Environments", I3D 2001, March 2001, pp. 111-120.
- Gary Singh, "Brushing Into Haptics (About the Cover)", IEEE Computer Graphics & Applications, pp. 4-5, 24(2), May 2004. [Article about the dAb painting system.]

FELLOWSHIPS & COMPETITIVE PROGRAMS

- NVIDIA Fellowship, 2003-2004
- Link Foundation Fellowship, 2002-2003
- National Science Foundation Summer Program in Japan, Summer 2002

EXPERIENCE

UNC-CHAPEL HILL July 1998 to present

Current: Research Assistant for GAMMA group, <http://www.cs.unc.edu/~gamma>
Previously: Research Assistant for Walkthrough group <http://www.cs.unc.edu/~walk>

- Dissertation research on realistic interactive simulation of oil painting using physically-based modeling of both brush and paint. Using both GPU and CPU for simulation tasks. See <http://gamma.cs.unc.edu/dab>, <http://gamma.cs.unc.edu/impasto>
- As member of Walkthrough group through 2002, researched the use of parallel hardware in occlusion culling in combination with levels-of-detail to speed up rendering of massive models.

UNC-CHAPEL HILL Summer 2003

Instructor, COMP 4

Taught a full-credit introductory undergraduate course on computers and computer science to a class of 15 students. Chose materials, planned schedule, prepared and delivered daily lectures, and wrote and graded all homeworks, quizzes, and exams.

TOKYO INSTITUTE OF TECHNOLOGY Summer 2002

NSF Summer Program, Visiting Researcher

Worked with a Japanese host researcher on development of better computer-based simulated artistic media. Specifically researched Kubelka-Munk rendering and several physical and heuristic approaches to simulating a thick, oil-like paint medium.

PIXAR STUDIOS, TOOLS DIVISION Summer 2001

Software Developer <http://www.pixar.com>

Worked in the Studio Tools User Interface group. Researched, designed, implemented, user-tested, and deployed a radial menu interface for Pixar's internal modeling and animation tools.

ACTUALITY SYSTEMS Summer 2000

Software Developer <http://www.actuality-systems.com>

Actuality Systems sells a unique, auto-stereoscopic, multi-viewer volumetric display device with a resolution of around 90 million voxels.

- Developed efficient algorithms for rasterizing lines in 2D polar and 3D cylindrical coordinate systems for 3D display.
- Wrote successful patent applications for those algorithms.
- Wrote visualizations in OpenGL to display results of 3D line rasterization algorithms and to help demonstrate the unusual coordinate system of the 3D display itself.
- Implemented an initial version of OpenGL support for the 3D display as a custom driver for the GL-compatible MESA graphics library.
- Laid out the design for the rest of the MESA driver to be filled in as other parts of the hardware system were completed.

EXPERIENCE - (CONTINUED)

NUMERICAL DESIGN LIMITED Summer 1999 Software Developer <http://www.ndl.com>

- Designed and implemented an inverse kinematics (IK) animation system for the NetImmerse game engine.
- Helped redesign the NetImmerse animation system to better support arbitrary animation controllers of which the IK controller would become one.
- Wrote all parts of the IK including two separate numerical IK solvers. (C++)
- Wrote IK export support for 3DStudio MAX (2.5 and 3.0) using its SDK, and some support routines in MaxScript to make the IK animator's life easier at export time. (C++, MAX API, MAXScript)

NETWORK ASSOCIATES, INC. February 1998 to June 1998 Software Developer (contract position) <http://www.nai.com>

- Contributed in the effort to create a modern GUI client to serve as the unified front end to NAI's Gauntlet firewall product on both Unix and Windows NT platforms.
- Wrote portions of the GUI and front-end client in Java, C, and C++.

VISIX SOFTWARE, INC. June 12, 1995 to January 1998

Started as Technical Support Engineer, and moved up to Software Engineer.

- Worked on many parts of Visix's cross-platform C/C++ application development framework from Drag-and-Drop support, to internationalization and locale support, to developing a robust and flexible new toolbar widget for the toolkit.

TOSHIBA SYSTEMS/SOFTWARE R&D CENTER, Kawasaki Japan. Trainee/Intern October 1993 - July 1994

- Collaborated with researchers in a typical Japanese R&D lab.
- Implemented and analyzed an artificial intelligence algorithm for automatic faults diagnosis in component systems.

YALE UNIVERSITY and **UNIVERSITY OF MICHIGAN** Research Assistant Summer 1992, 1993

- Completed projects based on real-time distributed juggling robot:
- Built vision circuit boards; derived and implemented inverse kinematics (Yale).
- Designed and successfully implemented a parallel-architecture neural network controller on Transputer processors (Michigan).

SKILLS

- **Languages:** C++, C, NVIDIA Cg, Python, Java, Perl/CGI, HTML, Javascript/ECMAScript, Lisp, Scheme, ML/SML, sh, csh, bash, some x86 Assembly, some Postscript.
- **Development Tools and APIs:** OpenGL, SGI OpenMP, Pixar Renderman, Visual C++, Cygwin, GNU gcc/g++/gdb, GNU make, Symantec Cafe, emacs.
- **Applications:** Microsoft Office, LaTeX, Matlab, Adobe Photoshop, Macromedia Flash, Adobe Premiere, Blender 3D, 3DStudioMAX, Sound Forge, Cubase.
- **Software Skills:** 3D graphics, numerical methods, OOP, multi-threaded and parallel programming, cross-platform issues, double-byte character issues, NLS, internationalization.
- **OS Experience:** Windows 95/98/NT/2000/XP, Linux/Unix (many variants).
- **Human Languages:** English (Native), Japanese (Fluent), French (Intermediate).
- **Hobbies:** Playing guitar, singing, songwriting, computer games.