Morgan McGuire
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Waltham, MA

Consulting Resume

I prototype and evaluate new ideas for companies, advising them on computer graphics and architecting high-level systems. I work at an architectural level but have hands-on experience in the trenches with software development and graphics hardware. The software architectures and APIs I create stand the test of time. My background in both industry and research experience, enables me to adapt the newest ideas in 3D and image processing into workable solutions for real software products.

Experience

1996-Present **Independent Consultant,** Waltham, MA

Recent Clients

ROBLOX
I designed the overall graphics architecture for a Silicon Valley web gaming startup and personally optimized the rendering pipeline. I added new visual effects and achieved a 4x peak frame rate improvement and robustness across varying graphics hardware.

Mitsubishi Electric Research Laboratory
I optimized the prototype 3DTV system (previewed at SIGGRAPH 2004) to execute all computations on a battery of eight networked GPUs. I designed and built hardware and software for a multi-view camera, then used that camera to film test sequences for the MPEG multi-view working group.

BAE Systems
I architected and implemented a series of systems for using GPUs to solve hard problems in the defense industry. These include rapid line-of-sight computation, Doppler radar simulation, and the fitness function for an OAV placement optimizer.

E Ink
Built a simulator for a next-generation electronic paper display to be used on e-books and retail signage applications. The simulator accurately reproduced the physical characteristics of the experimental display due to molecular changes in its structure.

2000- **Project Manager for the Open Source G3D Engine,** Sunnyvale, CA
G3D is the best open general-purpose graphics engine available. It is in the top 0.1% of the 100,000 projects on SourceForge.net. G3D has been downloaded by 50,000 developers since the first public release in 2002 and is used in shipping commercial games, industry research, and courses at Brown and Harvard Universities. I started the G3D project and continue to write most of the code. I remotely manage a team of 9 programmers and writers using web forums, e-mail, and issue tracking software.

2000-2002 **Senior Architect at Oculus Technology Corporation**, Boston, MA
I designed and implemented the web browser-like user interface, visual programming tool, and plug-in APIs in Java for the connectivity software Oculus CO. CO connects variables in major engineering tools like AutoCAD, SolidWorks, ProEngineer, and PTC to create unified design environment. I was featured on the JXTA website for my contributions back to Sun's peer-to-peer API.
http://www.jxta.org/project/www/bios/BioArchive.html

1998-2000 **Senior Graphics Architect at Curl Corporation**, Cambridge, MA
I joined Curl as the first regular employee and helped grow it to over 100 employees and a $500M valuation. I designed the 2D and 3D graphics systems and parts of the compiler for the core product, a web-based platform and tool set similar to Macromedia Shockwave. In addition to software design and implementation I hired and managed teams of up to 15 engineers, wrote three patents and made sales calls.

1995-1998 Research Assistant to Dr. Harold Stone
NEC Research Institute, Princeton, NJ.
I developed Matlab and C++ (MEX) routines for wavelet and Fourier image registration and pattern analysis. My independent research resulted in a patent on a new image registration method that was faster, more robust, and more capable than previous methods.

1993-1995 Intern with Dr. Stephen Lavenberg and Dr. Miriam Masullo
IBM T.J. Watson Research Center, Yorktown, NY
Created web and multimedia tools at the very beginning of the multimedia and internet revolution.

Education

Candidate for a Ph. D. in computer graphics at Brown University, *estimated completion 2005*
Sc. M., Computer Science, Brown University, 2003
M. Eng., Computer Science and Electrical Engineering, MIT, 2000
S. B., Electrical Engineering and Computer Science, MIT, 2000

Patents

"Image Registration Method". US Patent 6,266,452, July 24, 2001

"System and method for compile-time checking of units". US Patent 6,598,186, July 22, 2003

Additional patents pending in the areas of Video Processing, Computer Graphics, and Online Entertainment.

Publications

A list of publications can be found on my university site, http://cs.brown.edu/~morgan. These include scientific and industry papers on hardware accelerated rendering, programming languages, vision, and image processing. I wrote chapter on shadows in GPU Gems that NVIDIA used to help optimize id Software's DOOM 3. That book won the Game Developer Magazine *Front Line* award in 2004. I'm currently finishing a computer graphics textbook for Prentice-Hall and frequently write industry articles on C++ and software engineering.

Honors and Service

Awards and Fellowships
1st and 2nd place in the ACM SIGGRAPH Student Research Competition (2004), NVIDIA International Ph.D. Fellowship (2003 and 2004), Andy van Dam Fellowship (2002), Hitachi America Scholarship (1994), Navy Science Award (1994)

Service to the Profession
I3D 2005 Poster Session Co-chair, reviewer for I3D 2005, Eurographics 2005, *ACM Transactions on Graphics*/SIGGRAPH (since 2003), *IEEE Transactions on Image Processing* (since 2000), *IEEE Transactions on Visualization and Computer Graphics* (since 2003), ICIG 2004