

PATRICK M BRENNAN

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PROFILE

Principal Software Engineer with demonstrated proficiency in delivering high-quality code in complex domains. Areas of expertise include C#, C++, industrial robotics, 3D graphics, networked simulation, computer-aided design, and Windows programming. Outstanding verbal and written communications skills.

TECHNICAL SKILLS

C++, C#/.NET, Flash MX/ActionScript, COM, Standard Template Library (STL), C, Microsoft Foundation Classes (MFC), DirectX, XML, PHP, MySQL, JavaScript, Perl
Microsoft Visual Studio, Windows, MacOS 9, Palm OS, Unix, Metrowerks CodeWarrior
Flash MX, GoLive 6.0, LiveMotion 2.0, Flash 5, Photoshop, Illustrator.

WORK EXPERIENCE

BlueShift Technologies (<http://www.blueshifttech.com>), Andover MA 2006-present

Senior Software Engineer

Created and maintained embedded and supervisory software for industrial robotics applications.

- Maintained and extended software for a vacuum robot for use in semiconductor manufacturing.
- Responsibilities include the layer between high-level commands and low-level control API, including trajectory planning, low-level device configuration, event handling, error reporting/logging, and data gathering.
- Implemented methods to correlate sensor events (laser beam covering/uncovering) with timestamps and joint angles, propagate the sensor event information across the unmanaged/managed boundary to the supervisory layer of the software, and transform the sensor event information into positional values indicating the error offset of a wafer center from its assumed position.
- Extended the code to a new dual-arm robot configuration. This required extensive modification to the entire library.
- Inherited a vendor-supplied code base, debugged it, extended it, and am currently working to render it obsolete by rewriting it in C#/.NET.

Convoq, Inc., Lexington MA

2002-2006

Principal Software Engineer

Designed, developed, maintained and extended the client for ASAP.

- Built Flash MX-based front-end console for Convoq ASAP, an enterprise Instant Meeting and Collaboration system.
- Built all the major base classes for client management, contact management, and client/server communication in a Flash object hosted by a Windows container.
- Built a real-time shared trace object and a debug monitor for use in development as a supplement to Flash's debugging tools, which allowed inspection of objects and user-initiated function calls in real time
- Developed techniques for troubleshooting and optimizing Flash files for performance.
- Built a Browser Helper Object for use in integration of ASAP console with Salesforce.com, a web-hosted application. The BHO was built using C++ and COM.
- Contributed minor C# code to the ASAP server and the ASAP superadmin tool.

Harvard Associates, Cambridge MA

2002

Principal Software Engineer

Developed and maintained educational economic simulations.

Adobe Systems Inc. (<http://www.adobe.com>), Burlington MA

2000-2002

Principal Software Engineer (Computer Scientist)

Designed and developed modules of the award-winning Adobe LiveMotion 2.0 web animation package for Windows and Macintosh.

- Designed and implemented an optimizing code generator to translate JavaScript code in LiveMotion into Flash (.SWF) ActionScript byte codes, resulting in LiveMotion 2.0's ability to export scripted behavior to Flash files (LiveMotion 1.0 did not export scripted behavior, which was considered a weakness of the product).
- Extended and maintained in-house XML-based tools used to validate and improve LiveMotion's export to Flash.
- Integrated Adobe's proprietary serial number validation engine into LiveMotion 2.0, giving the application the ability to use company-standard serial numbers and installation tools.
- Developed all code in C++ with heavy utilization of STL, in a portable fashion. Maintained code on Windows (95/98/Me/2000/XP) and Macintosh (OS9/OSX) platforms.
- LiveMotion 2.0 won the Best of Show Award at the 2002 MacWorld.

MÄK Technologies Inc. (<http://www.mak.com>), Cambridge MA

1997-2000

Senior Software Engineer (Network 3D Game Developer)

Tech lead for a team designing and developing a real-time strategy game simulating modern US Marine Corps amphibious warfare.

- Designed the game and wrote creative design document. Designed the game's GUI. Designed the game's internal architecture and wrote technical design document. Managed budget and schedule. Defined tasks and timeline. Designed user interface. Managed one additional programmer during implementation.
- Worked directly with the customer as primary technical contact. Managed customer expectations, made technical and nontechnical presentations, and filed formal progress reports.
- Developed all code in C++ using STL and MFC for Windows 95/98 platform.

Papyrus Design Group (<http://www.sierra.com>), Watertown MA

1995-1997

Senior Software Engineer

Designed and developed in-house tools to create and manage 3D models and artwork for deployment in home computer games.

- Created, maintained, and extended DOS applications to translate 3D Studio and DXF format models to Papyrus's proprietary 3D format.
- Wrote an efficient low-level rendering engine, with joystick and mouse support, to support interactive manipulation of the models being translated (i.e. the user can view, inspect and modify various aspects of the models). Wrote polygon consolidation code for reducing polygon count within models. Wrote an efficient BSP tree builder within translation code.
- Designed and developed an application to enable users to create and edit track models for automotive racing games, using C++ on Windows 95. Wrote base C++ classes for all objects within a race track building application.

Atlantic Aerospace Electronics Corporation (<http://www.aaec.com>), Waltham MA 1992-1995
Software Engineer (Professional Staff)
Worked on the development of automatic target recognition systems for radar and IR applications.

- Developed database-driven synthetic aperture radar (SAR) simulator software for large, high-resolution imagery (2km x 2km at 1m resolution). Simulator performed radiosity calculations and line-of-sight shadowing. Co-authored project proposal. Managed all technical aspects of the project. Designed and coded all the modules. Wrote code to manage a multi-thousand-reflector database and synthesize element contributions into a single image.
- Ported IR detection and discrimination software to the Khoros software framework.
- Developed software to perform geolocation and orthorectification of SAR imagery, in the AVS software framework.
- Developed software to analyze CAD models and generate radar and IR signature predictions. Analyzed an existing $O(N^2)$ algorithm to generate radar reflector maps, and invented an alternative $O(N)$ algorithm to provide superior results and reduce processing time.
- Built and analyzed EUCLID 3-D solid models of military ground targets (tanks and APCs).

Parametric Technology Corporation (<http://www.ptc.com>), Waltham MA 1991-1992
Software Engineer

Designed, programmed, and debugged portions of the Pro/ENGINEER mechanical design automation package. Overhauled layers functionality, replacing 32 numbered layers (bit-encoded by object) with an arbitrary number of named layers, while preserving backward compatibility. Layers overhaul entailed the modification of hundreds of files in the source tree.

Computervision Corporation, Bedford MA 1987-1989
Software Engineer

Designed, programmed, and debugged portions of the CADD5 4X Solidesign solid modeling package. Designed and implemented user commands to efficiently compute the minimum distance between arbitrary solid objects, in order to check clearances. Designed and implemented a user command to generate tool paths in drilling applications.

Ibidinc, Hartford CT 1983-1986
Programmer

Developed consumer software for microcomputers, primarily games. Wrote an efficient engine for rendering low-level graphics primitives, and a complementary image description parser, for the Apple II. Wrote sprite-based arcade action modules (“ski sequence”) for the Apple II and Commodore 64 versions of *The Alpine Encounter*, an adventure game. Wrote a floating-point math library for the Apple II and used it as the core of a childrens' spreadsheet program. Wrote portions of *Choplifter* for the Atari 7800.

EDUCATION

Worcester Polytechnic Institute (<http://www.wpi.edu>), Worcester MA 1989
Bachelor of Science in Mechanical Engineering with High Distinction

Major Qualifying Project : *A Finite Element Formulation for Micropolar Bodies* (since published).

Virginia Polytechnic Institute and State University (<http://www.vt.edu>), Blacksburg VA 1989-1991
Graduate Study in Mechanical Engineering

- Developed an error-tracking guidance system for an Automated Guided Vehicle.
- Participated with a six-person team to design and code an X Windows-based user interface for a new remote manipulator for nuclear steam generator maintenance.
- Course work included Advanced Controls, Advanced Kinematics, Industrial Robotics, Artificial Intelligence, Numerical Methods, and CAD Software Engineering.

PUBLICATIONS

Playwrights' Platform Web Site (<http://www.playwrightsplatform.org>) : Designed the site, created artwork, built and coded site, sourced domain and hosting, maintained site. The site uses a MySQL database with PHP code to manage front-end and back-end management.

"ANT : Simulated Evolution on a PC", in *Carnegie-Mellon University Artificial Intelligence Repository*,
<ftp://ftp.cs.cmu.edu/user/ai/areas/genetic/ga/systems/ant>

"Finite Element Analyses of a Two-Dimensional Microelastic Bar and Curved Beam", in *Proceedings of the 1990 ASME International Computers in Engineering Conference, August 5-9, 1990*, with J.J. Rencis and R. Purasinghe.

OTHER LANGUAGES AND ENVIRONMENTS

LISP, MATLAB, Prolog, ksh, tcsh, awk, FORTRAN, FORTH, Pascal, BASIC, 68HC11, 8086, 8080/Z80, 6502, MS-DOS, VMS, Glide, GKS, PHIGS, Khoros 2.0, AVS.