

## Patrick M. Mills

---

500 South Adams Street, Annex B  
Arlington, VA 22204  
Voice: (571) 338-4657, Fax: (703) 920-0407  
pmills@ieee.org

### EXPERIENCE

#### **NeverLand Software & Systems, Arlington, VA.**

*Senior Computer Engineer:* Design and implement websites including the Association for Healthcare Foodservice, Women in Aerospace, AFP/DC, NAID-Europe, NAID, HFM, Supernus Pharmaceuticals, The St. Joe Company, CIAA, IFDA, ACP, ACF, and ITAC using XHTML, XML, HTML, JavaScript, CSS, CGI programming on Linux (Apache) and Windows (.NET) servers. Additional projects for CBS, MCI, Honda, the country of Taiwan, Fleishman Hillard, Brodeur Porter Novelli, Weber Shandwick/Powell Tate, and Nike. Interactive development using Flash, image creation using Fireworks, Paint Shop Pro, and Photoshop. Create and maintain SQL databases through programmatic control systems; develop AJAX front-ends. Develop custom software under Windows, Unix, and Macintosh. Developed low level drive analysis program for Fujitsu for distribution by Dell that ran transparently on Windows 2000, NT 4, NT 3.5, Win ME, Win98, Win95, and DOS; the Visual C++ program automatically extracted and installed a VxD / system driver as necessary. Please visit <http://www.nvrlnd.com> for a list of projects and websites. (1994 - present)

#### **TheNetOffice, Inc., Newport Beach, CA.**

*CIO:* Develop and implement Internet technologies for business users. (1998 - 2000)

#### **Telework Analytics International, Inc., Potomac, MD.**

*Head Programmer:* Developed a Windows based computerized auditing system to gather work/lifestyle information from company employees and generate reports detailing individual and company teleworking / telecommuting compatibility. A second phase program interacts with Microsoft Excel using DDE. Third phase uses Visual Basic for Excel routines to generate analyses. Authentication ensures data integrity; hardware key maintains usage count for billing. Program supports multiple languages including American English, British English, French, German, and Spanish. Wrote illustrated documentation for users and support staff. Created process-color magazine advertising layouts. Managed Windows and Macintosh computers. (1994 - 1995)

#### **Bethesda Softworks, Rockville, MD.**

*Programmer:* Developed 3D fractal landscape editor (with illustrated documentation) and other utilities used in several commercial games, Windows and HTML consulting, developed a Windows installer. (1995)

#### **Computer Architecture Research Laboratory, Computer Engineering Dept, USC.**

*Research Assistant:* Developed code for simulating various cache designs in superscalar architectures. (1994 - 1995)

#### **Graphics Laboratory, Engineering Department, Swarthmore College.**

*Programmer:* Developed an X-Windows library for use in Computer Graphics instruction. The library supports 2D and 3D graphics including: rotations, hidden surface removal, shading, and rendering. (1993 - 1994)

#### **Perception Laboratory, Psychology Department, Swarthmore College.**

*Programmer:* Designed and implemented a Macintosh based program to time visual responses to a sequence of images. The program allows the user to define timing and feedback options and then records individual user's responses for further analysis. Wrote illustrated documentation for support staff. (1993)

#### **Jet Propulsion Laboratories, grant to Engineering Department, Swarthmore College.**

*Systems Programmer:* Developed a Macintosh front end to control a resource allocation neural network analog integrated circuit. The front end provided a graphical display of user / resource allocations as well as allowing complete control of the hardware. (1993)

#### **Battelle Pacific Northwest Division, Applied Physics, Richland, WA.**

*Programmer:* Selected for Science and Engineering Research Semester by the US DOE (security clearance required). Designed and implemented an image processing system for use by Dugway Proving Grounds. The system captures live video in streams and single frames, and allows storage, retrieval, and control of VCR input in a frame by frame manner. Live video or single frames are contrasted simultaneously with filtered images. Wrote a 60+ page on-line help system with color illustrations and operator's manual. Designed a driver for use with Selectra's VuPort to control a Panasonic AG-1960 VCR. Wrote Dynamic-Link Library to provide Windows control of Matrox's JPeg routines. Developed custom user

interface for use by Battelle with Windows programs, including custom Message Boxes, Dialog Boxes, Super Bars, Common Dialogs, and shading routines. (1992)

**Apollo Computer Laboratory**, Engineering Department, Swarthmore College.

*Chief System Administrator:* Upgraded and maintained a network of HP/Apollo computers. Ensured integrity of system for professors and students. Wrote software to ease use of the multitasking, windowed environment. Wrote a System Administrator's Manual for training of future System Administrators. Wrote Structural Engineering software, redesigned network and system configuration to allow for new networking options. (1990 - 1994)

**NCSA Supercomputer Time Grant**, University of Illinois.

*Researcher:* Received a Time Grant to develop neural network models on a Cray Y-MP. Developed several back-propagation networks for use in Cognitive Psychology modeling. (1991)

## **PUBLICATIONS AND PATENTS**

P Mills, P Patterson, J Zara, S Smith. Patent 7,573,627. Amplified bimorph scanning mirror, optical system and method of scanning. (August 11, 2009).

J Zara, P Mills, P Patterson. "Polyimide MEMS Actuators for Medical Imaging." *Proceedings of SPIE Conference on MOEMS Display and Imaging Systems III*. Vol. 5721, 93-103, 2005.

P Patterson, P Mills, J Zara. "Amplified Bimorph Scanning Mirror for Optical Coherence Tomography." *Proceedings of the 2004 IEEE International Symposium on Biomedical Imaging: From Nano to Macro*. (Arlington, VA. April 2004).

Patrick Mills. "Fuzzy Logic Control of a Four Rotor Autonomous Aerial Platform." *Proceedings of the 2001 International Conference on Computational Intelligence for Modeling, Control and Automation*. (Las Vegas, NV. July 2001).

JMH Edwards, N Hodson, and PM Mills. Patent 6,247,005. Expert system for research, data collection and analysis. (June 12, 2001).

Patrick Mills and John Bowles. "Fuzzy Logic Enhanced Symmetric Dynamic Programming for Speech Recognition." *Proceedings of the 5th IEEE International Conference on Fuzzy Systems*. (New Orleans, LA. September 1996).

Juan Martinez, John Bowles, and Patrick Mills. "A Fuzzy Logic Positioning System for an Articulated Robot Arm." *Proceedings of the 5th IEEE International Conference on Fuzzy Systems*. (New Orleans, LA. September 1996).

TM Conte, KN Menezes, PM Mills, BA Patel. "Optimization of Instruction Fetch Mechanisms for High Issue Rates." *Proceedings of the 22nd Annual International Symposium on Computer Architecture*. (Santa Margherita, Italy. June 1995).

LaserUser for Windows - prints a cover page when a document is printed.

## **SKILLS**

Computer Languages C, C++, C#, 80x86 and 680x0 Assembler, JAVA, Pascal, Fortran, BASIC, Prolog, CLOS, VHDL, Postscript.

Scripting Languages Perl, HTML, XML, SQL, JavaScript, PHP, Python, ActionScript, C/Bourne/Bash shells, DOS batch, AppleScript.

OS Platforms Windows 3.1/95/98/ME, Windows NT/2000/XP/2003/Vista, Windows CE, Linux, Solaris, HP/UX, BSD, System V, Macintosh OS X, DOS.

Development Platforms MS Visual C/C++, .NET, MFC, Borland C/C++, Watcom, GNU.

Design Software Cadence OrCAD, Tanner, IntelliSuite.

Modeling Software Ansys, SolidWorks, COSMOS, Mathematica, MATLAB.

Animation Software Maya, 3D Studio, MilkShape, Extreme 3D, Ray Dream Designer, Detailer, Panda 3D, Flash.

Media Software Freehand, Photoshop, Premiere, Paint Shop Pro, Fireworks, Illustrator, Painter, Quark.

Computer architecture and operating system design. Built Zilog, 6809, 6811, 6812, Atmel, and Renesas based embedded systems; designed and fabricated a fuzzy logic processor to be used for sound location; designed a MIPS R4000 processor. Developed a 6811 based SIMD system to control a 6-legged robot. Developed embedded controller with inertial guidance to control UAV. Extensive experience with GUI design. Develop software for use on Unix (Linux, Solaris, BSD, HP/UX, Apollo, Ultrix, Sun OS), Windows 32/16-bit, DOS, and Macintosh. Network programming using Unix/Windows sockets, TCP/IP, USB, Appletalk, and serial/parallel connections. Parallel programming using Beowulf clusters and Intel MMX/SSE extensions; multi-threaded experience using Windows Threads, pThreads, and MPI. Security programming using SSL, PGP, Public Key, 3-DES, DES, SHA, and other PKI/symmetric/ hashing algorithms.

## **EDUCATION**

**The George Washington University**, Washington, DC.

Doctor of Science, *expected* December 2010. Dissertation: MEMS Cellular Robotics. Research Assistant, Teaching Assistant. GPA 4.0 Recipient of *Emmanuel Beck Endowment Scholarship in Computer Engineering*.

Research: Biomedical Imaging – designed and programmed real-time (15 – 60 fps) Ultrasound and Optical Coherence Tomography (OCT) Imaging system, assembled and maintained imaging hardware. Psychology – designed, fabricated, assembled, and programmed wireless system for motion capture experiments. Robotics – assembled and programmed soft real-time embedded Linux controllers with GPS, inertial guidance and encrypted radio links for unmanned aerial vehicles (UAV) funded by USAF Office of Scientific Research. Named Inventor on one granted and one pending patent applications for MEMS devices.

**University of South Carolina**, Columbia, SC.

Master of Science, May 1996. Masters in Computer Engineering. Thesis: Fuzzy Speech Recognition. Research Assistant, Masters Level Teaching Assistant. GPA 3.9 Member IEEE and honor society Eta Kappa Nu.

Research: Very Long Instruction Word (VLIW) Computer Architecture model for HP & Intel used in planning the Itanium.

**Swarthmore College**, Swarthmore, PA.

Bachelor of Science, June 1994. Major in Engineering. Strong background in Engineering, Computer Science, Mathematics, Psychology, and English Literature.

**The McCallie School**, Chattanooga, TN.

Graduated May 1989, Cum Laude. President and founder of Young Democrats, President of Young Environmentalists, and Clerk of Science Club.

## **LEADERSHIP**

**Improve The World** – Designed, implemented, and tested portable, ultralight satellite based communication system for use in humanitarian relief. Member of Technical Advisory Board.

**BotBall** - Judge for KISS Institute for Practical Robotics Botball Tournament (2000 and 2001).

**Swarthmore College Climbing Club** - Competent instructor and guide.

**Boy Scouts of America** - Eagle Scout, Order of the Arrow, God & Family, God & Country, Arrow of Light.

**Member of IEEE since 1995 and ACM since 1997.**