

BRIAN RUSSELL, PhD

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Computer Scientist Software Architect Project Leader Project Manager

Computer Science PhD, Senior-level Software Architect and Implementation Strategist. Designed and implemented artificially intelligent wireless routing protocols, real-time synchronized distributed architectures, large-scale portable architectures, multithreaded applications, portable graphical user interfaces. Forms solutions by drawing on background in multiple disciplines including Operating Systems, Artificial Intelligence, Networking, Artificial Languages and Software Engineering. Developed high quality software products in diverse environments. Invented revolutionary new data format that became an ANSI standard.

Qualifications

Internet: TCP/IP, Datagrams, UNIX sockets, Windows sockets

Languages: C++, Java (Sun Certified Programmer), ANSI C, Visual C++, Pascal, PL/I, Fortran, ADA

Design Skills: OOD, POSIX multithreaded, OS/2 multithreaded, GUI

Hardware: SPARC, Intel, RS6000, Motorola 680x0, AMD 29K, AT&T 3B2, IBM 370, VAX

Operating Systems: UNIX SVR4, Linux, Solaris, Windows 98, DOS, OS/2, Windows NT/95, AIX, HP/UX

Graphical User Interface: Java, OS/2 Presentation Manager

Interprocess communication: Shared Memory, Memory Mapped Files, Message Queues, /proc

PROFESSIONAL EXPERIENCE

Rutgers University, Piscataway NJ

PhD Researcher, Instructor "Learning-Based Route Management In Wireless Ad Hoc Networks" 2003 to 2010

- Devised a cross-layer routing efficiency predictor that combines effects or noise from the MAC layer and router congestion from the network layer into a single time-based routing metric.
- Designed a new cross-layer, learning-based routing protocol for wireless ad hoc networks that uses experience gained from existing network traffic to make initial routing decisions based on current network conditions and can adjust previously existing routes as new routes or new noise sources are added to the wireless network.
- Invented a portable wireless network environment simulator in C++ to quickly explore and evaluate alternative machine-learning approaches to autonomic route management.
- Taught courses in Networking, Operating Systems and Software Engineering focusing on distributed application architecture and emphasizing efficient object-oriented design and development.

Commence Corporation, Oakhurst, NJ

Consultant/Senior Architect 2002

- Eliminated customer configuration management problems by designing and implementing configuration information comparison software in C++ to let customers purchase product upgrades while retaining customized information.
- Provided precise control of configuration upgrades by designing an extensible, human-editable directive language in an object-oriented C++ implementation on Windows NT.
- Solved distributed Windows NT database security problems with SQL extended stored procedure.

Dow Jones, South Brunswick, NJ

Consultant/Senior Architect 1999 to 2001

- Reduced operating costs by \$30,000/month by designing and implementing multithreaded fault-tolerant programs and libraries in C++ for a critical UNIX/Solaris real-time distributed message distribution and management system.
- Implemented object-oriented architecture that included TCP/IP sockets, UDP datagrams, shared memory, memory mapped files and message queues.
- Eliminated upgrade compatibility problems by inventing a new extensible message format. This message format is now the primary internal data representation used within Dow Jones.
- Decoupled software dependencies by designing and implementing query languages and object-oriented query processors, rule-based information evaluators and message format translators in C++.
- Designed and completed software in an environment of constantly shifting system requirements.

NCR Consulting Group, Berkeley Heights, NJ

Consultant/Project Leader

1997 to 1998

- Technical Project Leader for Y2K consulting center, responsible for a team of 26. Major Clients included AT&T.
- Improved Y2K problem detection and localization by redesigning Y2K tool graphical user interfaces.
- Improved and standardized Y2K problem detection by developing and teaching training courses.
- Devised and implemented shell scripts that improved staff effectiveness.

Essential Software, Cupertino, CA

Consultant/Senior Software Engineer

1997

- Improved DOS wafer test driver application for a major Silicon Valley chip manufacturer, KLA Tencor.
- Upgraded hard-coded test wafer specifications to customizable specifications to support different wafer sizes and individual chip selection on the wafer.
- Added remote communications heartbeat to monitor the communications link through serial ports between the test computer and the wafer test hardware.
- Added new windows to DOS graphical user interface to support the customizable wafer specifications and remote communication heartbeat features.

McAfee Associates, Santa Clara, CA

Consultant/Senior Architect

1996 to 1997

- Solved space problem by inventing a new ultra-compact machine independent P-code instruction set.
- Reduced the size and increased the flexibility of virus detection software by designing and implementing an ANSI C compiler that generated ultra-compact P-code to combat the spread of computed viruses.
- Designed and implemented preprocessor, object file format, linker and disassembler for the ultra-compact P-code.
- ANSI C compiler, preprocessor, linker and disassembler written in C++ on Windows NT.

AT&T BELL LABORATORIES

Portable Source Level Debugger Design and Implementation

- Designed and implemented portable symbolic debugger products in C++ using an original object-oriented architecture. The design supports source level debugging of multithreaded programs, optimized code and dynamic shared libraries.
- The architecture isolated portable graphical user interfaces, execution control mechanisms, C++ expression evaluation, machine specific behavior, operating system process control mechanisms, native and TCP/IP cross-debugging support and incremental processing of multiple formats of debugging information. The modular design made it possible to port the debuggers to new platforms, which was not possible with previous debugger implementations.
- Invented performance enhancing algorithms for incremental processing of compiler-generated debugging information, which resulted in significantly faster debugger performance, especially when debugging large programs.
- This architecture has been the basis of debuggers sold by AT&T Bell Laboratories, Borland International and Metaware.

Invented DWARF Debugging Information

- Invented DWARF, a revolutionary new format for the debugging information communicated from compilers to source level debuggers.
- The new DWARF format was the first to be completely free of machine dependencies, facilitating cross debugging on different host and target hardware architectures.
- DWARF was the first to separate vendor-specific compiler implementation details, thus making it possible to change a compiler without forcing changes to the debugger or even to use a single debugger with programs compiled on compilers from different vendors.
- Complex debugging information is free form, self-describing and extensible, making it both forward and backward compatible even after any extension.
- The DWARF format has become an ANSI standard adopted as an industry standard for debugging information representation.

Education

PhD Computer Science, Rutgers University, New Brunswick, New Jersey.

BS Computer Science and BS Economics, University of Dayton, Dayton, Ohio.