Bob Rees

84 Lunda St.
Waltham, MA 02451

Summary Systems Architect with a Master of Science in Electrical Engineering and Computer Science from MIT and five decades of professional accomplishments in the creation, analysis, and control of complex interdependent real-time engineering systems. Extensive experience in the design, development, and optimization of user interfaces, embedded control systems, networks, drivers, operating systems, and electromagnetic devices.

Experience

2006 - present **The Goodman Group, Ltd.**
Research and Infrastructure Specialist
Provided engineering expertise (electrical generation & transmission, applied physics, systems analysis, calculus, data processing) via project research, analysis, discussion, critique, and writing. Designed and implemented layers of custom infrastructure to support and automate the production of very large highly-structured legal documents (expert testimony including tables, figures, footnotes, appendices, and reference excerpts). Developed tools and procedures to streamline and standardize complex editing by multiple contributors and to support multiple deliverables within a single metadocument. Prepared graphic content and optimized presentation for maximum clarity. Reviewed reference documents, selected/transcribed excerpts, and formatted those excerpts for inclusion as in-line quotes and cross-referenced appendix entries. Created and maintained database for tracking thousands of excerpts from hundreds of source documents. Installed, configured, and commissioned workstations.

2002 - present **Prospect Hill Consulting**
President
Self-employed consultant, providing design, strategic planning, and custom implementation/installation services for computer systems and other technology applications.

2001 **DMOD** (**Digital Media on Demand**)
Principal Software Engineer
Designed and implemented the Macintosh version of DMOD's *iPost* application for highly-secure peer-to-peer media file transfers via the internet. Created comprehensive user-friendly GUI using PowerPlant and Constructor. Adapted DMOD's proprietary transport layer to interface to the Mac file system and TCP/IP network driver. The application was socket-based and multi-threaded, and supported multiple simultaneous transfers.

1999 – 2001 **Into Networks** (formerly **Arepa.com**)
Principal Software Engineer
as **Client Software Architect**
Responsible for designing the next generation of Into's client platform for streaming software (click-and-play software title rental via the internet). Established and refined goals and requirements. Researched and analyzed cache replacement algorithms and prediction strategies, and coordinated the activities of other researchers. Wrote design proposals for improved caching architecture and related support modules.
as **Macintosh Project Leader**
Planned & coordinated development of a Macintosh version of the client software. Interviewed, hired, & managed in-house Macintosh development team. Contracted and

managed relationship with consulting firm. Wrote & reviewed design specifications and implementation/test plans.

as **Client Software Developer**

Designed & implemented major portions of the virtual disk emulation layer for the Macintosh client. Wrote network driver for Macintosh proof-of-concept prototype. Debugged and demonstrated prototype. Designed & implemented next-generation virtual disk cache. Prepared & presented Mac client beta demo.

1997 – 1999 **Media 100** (spun off from **Data Translation**)

Embedded Systems Architect

Responsible for design & development of the "Back End" (driver & embedded software) of the *Media 100* video NLE (non-linear editor). Adapted Media 100's custom real-time OS to be cross-platform, to support new Windows-based version of the *Media 100* system in addition to original Macintosh version. Converted from async completion routine chaining to true threads; designed & developed thread library; implemented read/write locking with integral deadlock prevention; tuned scheduling algorithms to optimize performance.

Data Translation (MultiMedia Group)

1994 – 1997 *Principal Software Engineer*

Designed & implemented enhancements to NLE architecture (Macintosh host + embedded processors), including optimized multiprocessor coordination for effects rendering, video frame caching, file system interface for maximized throughput, real-time dual-stream effects, and accurate audio/video sync with full SMPTE standards compliance. Adapted software for new hardware revisions as well as support for new editing functionality.

1992 – 1994 *Senior Software Engineer*

Initiated simulation project to evaluate potential performance of existing video board. Devised & advocated enhancement (incorporating bus master & embedded processor) to achieve targeted throughput and latency. Collaborated with hardware team to design and refine this new hardware architecture. Designed & developed custom real-time distributed operating system (including memory management, multitasking, and packet-based interprocessor communication) that ran on Macintosh host and embedded processors. Designed & implemented video/audio playback/recording algorithms for online editing.

1990 – 1992 **Microcom**

Consultant

Designed & developed *Network Complete Undelete*, a Macintosh utility for remote file recovery from file servers. Developed custom session-layer network protocol handler. Wrote driver for coordinating background and network access to the delete-logging mechanism. Co-authored user manual.

1988 – 1990 **1st Aid Software**

Vice President of R&D

Designed & specified all of 1st Aid's products, including the HFS version of the *1st Aid Kit* (Macintosh disk recovery utility). Supervised development team (7 programmers). Implemented major portions of *Anti-Virus Kit* and other Macintosh utilities. Co-authored *1st Aid Kit Troubleshooting Guide* (300-page Macintosh diagnostic reference) and user manuals for all products.

1987 – 1988 **Telepresence Research**

Chief Systems Engineer

Designed & implemented client & server components of a Macintosh real-time multi-player game environment. Developed preemptive multi-tasking kernel, network interface drivers, and animation display library.

1986 – 1987 **1st Aid Software**
Technical Director
Designed & implemented original MFS version of *1st Aid Kit*. Wrote & edited portions of the first edition of the *Troubleshooting Guide*.

1984 – 1986 **Musicworks**
Software Synergist
Developed MIDI (Musical Instrument Digital Interface) software products for Macintosh computer, including *MegaTrack* (multi-track recorder/sequencer with GUI) and *DX/TX Librarian* (synthesizer voicepatch database system). Did production engineering and circuit board layout for Macintosh MIDI hardware interface products.

1984 **Synware Systems**
Consultant
Designed & built first commercially-viable MIDI hardware interface for the Macintosh computer. Developed MIDI driver, MIDI recording/sequencing library, and prototype Macintosh MIDI applications.

1981 – 1984 **BBN (Bolt Beranek and Newman)**
Senior Computer Scientist
MBB (general-purpose minicomputer / network node) project
Wrote microcode for disk controller, magtape interface, network interfaces, floating-point coprocessor interface, and protocol interpreters. Designed & implemented operating system for microcode diagnostics. Developed microcode development tools, including macro pre-processor and SCCS.
C/10 (microprocessor-based packet router) project
Wrote table-driven protocol state machine, HDLC network driver, and major portions of operating system firmware. Integrated diagnostics into power-up code.
BitGraph (microprocessor-based intelligent graphics terminal) project
Implemented major enhancements to the graphics firmware, including terminal emulation modes and dynamic pivot (landscape/portrait) support. Designed & specified window-oriented multi-process operating system.

Mass. General Hospital (Laboratory of Computer Science)
1978 – 1981 *Assistant Director*
Manager of systems programming staff (4 programmers). Project leader for implementing *MUMPS* system on VAX computer. Designed & implemented improved *MUMPS* database system. Chaired international *MUMPS* language ANSI standardization committee.
1972 – 1978 *Senior Programmer*
Designed & implemented major performance improvements in *MUMPS* disk system including multi-tasking, caching, and submerged seeks. Rewrote I/O system to support device independence.
1970 – 1972 *Programmer/Analyst/Engineer*
Implemented disk driver for *MUMPS* system. Developed utility program for off-line database maintenance (initialization, validity checking, backup, reoptimization, structure repairs).

Education

Massachusetts Institute of Technology
1970 MS (Electrical Engineering / Computer Science)
1968 BS (Electrical Engineering)