

RESUME

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Ultimate Career Goal

I am working toward the design, construction and habitation of space colonies in the shortest possible time frame, to allow expansion of the human race beyond the current terrestrial limitations, and to allow independent living groups the opportunity to decide their own fate. I do not foresee realization of this goal within the present government-structured space programs. Therefore, I am working toward achieving my objectives through for-profit commercial enterprises.

Immediate Employment Objective

I aim to be the chief architect/designer of a major private space exploration and development company, the system-level idea man, painting with broad strokes, identifying science and technology needed to build the complete system.

Until that opportunity is offered, I am available for positions where my background and interests can quickly benefit my employer, and to expand my skills in additional or supporting efforts. I am interested in "conventional" software jobs: An ideal situation would be a "concept to completion" one involving in the entire development cycle, preferably a [robotic] hardware product as well as software. I am also interested in Internet and Web application development and integration work where I could utilize my extensive recent experience with PHP and MySQL.

My most recent work is network system development, GUI and CLI design using Python, PHP, Javascript, CSS and PostgreSQL, Web development (including e-Commerce) with interfaces to MySQL in PHP and C++ ('nix & Windows), C/C++ for Windows (desktop, CE), client/server (Windows/FreeBSD) app development in C++ including protocol design, PHP, C/C++, and Perl CGI scripts, HTML, JavaScript, and hardware design; my diverse background also covers other languages and systems. My expertise and interests are in user-interface design, real-time systems, image processing, controls and robotics, hardware integration, diagnostics and debugging. I am experienced in start-to-finish system and software design: I built several programs from idea through completed software, including installation and setup utilities, user manuals, and online Help; four are currently active on the Internet. I have also done Java tutoring; and have installed, configured, and managed PC network systems.

Microprocessor Software Design Expertise

Assembly languages: 80x86/Pentium, 8051, 8035, 8044, 8085, 6800, 6301, Z80/Z800/64180, Z8000, RT-11, PIC
High-Level Languages: C/C++, PHP, HTML, CSS, Python, JavaScript, SQL, Java, Perl, CGI, XML, BASIC, PL/M-80/86, TECO, FORTRAN, PASCAL
Development Packages: Microsoft MFC, WordPress, VisualStudio .NET, Windows Help compiler, Macromedia Flash, InstallShield, NSIS (open source installer), Notes C/C++ API, Greenleaf Comm++, zApp, CodeBase 5.0, Magma Systems MEWEL, Metagraphics MetaWINDOW, Phar Lap 286-DOS Extender
Application Packages: MySQL, Lotus 1-2-3, Microsoft Word, PCBArtist, Qcad, DesignCAD 3D, OrCAD, Caligari trueSpace 2 & 3, Corel Draw, FoxBASE+/dBase III, WordPerfect, Lotus Manuscript, Lotus Notes, Lotus Magellan, Lotus Express
Operating Systems & Environments: MS/PC-DOS through v.6.22, Windows 3.0/3.1/3.11/98 / NT 3.51/4.0 / 2000 / XP / CE (PocketPC 2002/2003), FreeBSD through 8.2, Linux (multiple distros including CentOS 5, Red Hat Enterprise 4 & 5), OS/2 Warp, Lantastic, Tandy DeskMate, AmigaDOS, Macintosh, Novell (user), VAX/VMS (user)

Microprocessor Hardware Design Expertise

Microprocessors: Intel 8086/88/286/386, 8051, 8085, 8035, 8344, Microchip PIC16F88*, PIC32MX*, Motorola 6800, 68000, Hitachi 6301, 64180, National NSC-800, Zilog Z8, Z80, Z800, Z8000
Technologies: Microprocessor system architecture, network controllers, ZigBee, USB, RS-232 communication system design, CMOS, TTL and ECL circuit design, memory system design, disk-, user-, and analog-interface techniques, in-circuit emulation and debugging, PC board design, layout and power distribution, system packaging, hardware integration

Employment History

Note: Most of my work history is in contract and consulting positions.

L5 Software Development, Lynn, MA. *Software Developer, Consultant.* 9/1995 - present. Web site design and production, Web application development, contract programming, hardware/software system design and development, commercial desktop software development, FreeBSD Web hosting, source control using Mercurial, svn, cvs and SourceSafe.

- **Network system software development:** I have worked on software systems used by major cable system operators to monitor and control resource usage of millions of subscribers. The work included usage analysis, data aggregation, cluster configuration, system administration, and helping design and implement a totally new prepaid service offering. Back-end coding was done primarily in Python and PostgreSQL stored procedures with some shell scripting, and most of the user interface work was done with PHP, CSS and Javascript.

- **Web site design/coding:** I have been designing and building Web sites and components in LAMP environments ('L' is Linux and/or FreeBSD, 'P' is primarily PHP, also Perl) for over 14 years. The work has involved nearly every modern Web technology, including AJAX, CSS and XML, included addressing cross-browser (Firefox vs. IE) compatibility issues, and has required development in many languages including (X)HTML, JavaScript, SQL, Java and Unix shell scripting. I am extremely familiar with eCommerce, having written two custom shopping cart systems to handle complex product and pricing issues, including Authorize.net and PayPal gateways for online payment processing. My PHP experience started with writing procedural code with PHP 3 and has grown to include object-oriented programming using PHP 5. In building various sites I used custom code, frameworks such as Ruby on Rails, and content management systems including Wordpress, Drupal and Joomla, and I use Paint Sho Pro extensively for graphic design work.
- **Web application development:** In addition to public-facing Web sites, I have worked on several "back-end" Web applications. This work included designing communication protocols, building application servers in C/C++ to run on Linux/FreeBSD, interfacing Web services using SOAP and XML, and high throughput (up to 400 million+ hits per month) server code to update Flash banner ads in real time using MySQL data while simultaneously logging user metrics.
- **Contract programming:** I worked on many projects, primarily using C/C++. The work included a winCE device driver, updates for proprietary server applications, and serial communications code between custom hardware and PocketPC devices. I also worked on a video switcher application, both implementing a unique user interface and some video processing internals, and on Y2K date remediation. In addition, I worked on a Symbian multi-modal browser for use in cell phones, and contributed significant portions of the code for a high-security ID card printing system.
- **Hardware/software system design and development:** I was the primary contributor in two iterations of the hardware and software architecture definition and design of an intelligent thermostat system to contain heating costs in landlord-heated apartments. I did all of the hardware design, component selection, power supply design, schematic capture, PC board layout, software design, and made substantial contributions coding 8051 and 8- and 32-bit PIC microprocessors.
- **Commercial desktop software development:** I have written several software applications that I marketed with varying degrees of success through the Internet, including Web development tools, search spiders and media collecting robots. I have also developed several "desktop-only" applications (ones with no Internet code) including a utility for eliminating duplicate files, time logging software, and calendar applications.
- **FreeBSD Web hosting:** I ran a FreeBSD-based hosting service for a few years, requiring intimate knowledge of server configuration, security & operation, and developed custom shell scripts to automate many common hosting tasks.

Clients:

- **Active Broadband Networks**, Framingham, MA. 1/2010 – present. *Network system software development.* Design, develop and optimize software systems used by major cable system operators to monitor and control resource usage of millions of subscribers. Major rewrite of mission-critical usage analysis system, design and implement data aggregation component to support storing 2 months of data in progressively lesser granularity, high-availability cluster configuration user interface, support data replication between cluster primary and backup, system administration CLI command development in Python, helping design and implement a totally new prepaid service offering. Extensive work rewriting the GUI to provide a more uniform user experience, enhancements using Javascript and CSS. Software test plan execution and updates. Source code control using Mercurial. Back-end coding was done primarily in Python and PostgreSQL stored procedures with some shell scripting, and most of the user interface work was done with PHP.
- **DesignBlox**, Boston, MA. 7/2007 – 11/2008, **Adroit Interactive**, Boston, MA. 11/2008 – 1/2009. *Web app development.* Develop, optimize high throughput (up to 400 million+ hits/month) server code to update dynamic Flash banner ads in real time using MySQL database data, LAMP environment (Red Hat Enterprise Linux 4, 5). Develop PHP cron scripts for report generation. Develop administrative tools in PHP and shell script for system and user control using PHP SSH and OpenSSL for secure Web communication and database encoding, bug tracking using BugZilla and Redmine. Support Ruby/Rails MVC UI updates and enhancements. Financial services Web development including credit scoring via SOAP XML interface, admin page updates, credit report reformatting, SSN validation using Social Security Administration rules, cron script automatically updates tables monthly. Address cross-browser (Firefox vs. Internet Explorer) compatibility issues. Design & implement online rental application and customer login system for property management company with admin review, email notifications, document upload & management, multiple level admin access. Web sites all hosted in LAMP environments. (Adroit spun off from DesignBlox in November 2008.)
- **Intelligent Building Controls**, Portland, ME. 2/2007 - 2/2009. *Product development partnership.* Offsite (telecommuting) work. Duties: hardware/software architecture definition/design of communicating recording intelligent thermostat system to contain heating costs in landlord-heated apartments; includes thermostat modules communicating via ZigBee capable of writing to USB drives (host protocol), ZigBee USB dongle with Windows and Linux device drivers (device, host protocols), portable ZigBee reader with docking station, ZigBee repeater modules. Duties include all hardware design, component selection, power supply design, schematic capture, PC board layout, software design, coding for 8- and 32-bit PIC microprocessors and host computers (Windows, Linux), platform-independent monitoring software, manufacturing database design and development, and Web site development (LAMP environment).
- **OuterLink Corporation**, Lowell, MA. 9/2006 - 1/2007. *WinCE driver development.* Telecommuting/offsite development. Duties: winCE 4.2 device driver development to implement a unidirectional serial loopback port, and an installation program for the driver. The software was also verified under winCE 5.0.
- **Visual Venue**, Wayland, MA. 5/2005 - 9/2006. *Windows software development.* Telecommuting/offsite development. Duties: Develop a non-standard Windows GUI for a software-based video switcher using MFC, targeted to run in a .NET environment on Windows XP. DirectShow filter design and implementation. System architecture and code redesigns. FireWire device control.
- **Agori LLC**, Cambridge, MA. 9/2003 - 5/2005. *Multiple development projects.* Telecommuting/offsite development. Duties: Debug, complete TCP/IP server ActiveX control (Visual C++ code), build Visual Basic demo app. showing correct usage. Increase custom server performance playing proprietary video files. Create Windows viewer for

proprietary video files. Debug serial comm between Xray fluorescence (XRF) tool and PocketPC 2003 PDA. Design, implement win32 app. to download XRF data from winCE PDA. Update PocketPC PDA app's user interface, repair PDA report generator. Convert PDA API to DLL for use by other apps. Support end user DLL interface. Multi-platform (winCE, Symbian) multimodal browser development including C++ OOD, automatic speech recognition (ASR) encapsulation, interface, state machine design, implementation, custom hardware button handling, system event listener interface, system integration. Technical documentation, spec writing.

- **Computer Software Designs**, Westborough, MA. 4/2003 - 7/2003. *Product development partnership*. Telecommuting/offsite development. Duties: System-level design, hardware design (intelligent thermostat system), select components, schematic capture, Qcad PCB layout, order prototype boards, components, circuit assembly, Parallax BASIC Stamp PBASIC programming, Philips 80C552 (8051 core) assembler.
- **Agori LLC**, Cambridge, MA. 3/2003 - 4/2003. *Windows software development*. Telecommuting/offsite development. Duties: Design, develop a JPEG-to-AVI conversion system, integrate it into an existing Web server product. Design and build test code for module development and verification. Investigate file formats (JPEG-in-BMP still image, AVI). Visual C++ development/test for operation under Windows 2000.
- **TF Software LLC**, Merrimack, NH. 5/1998 - 12/1998. *VAX/VMS software development*. Design, document, and develop multi-threaded, cross platform terminal intercept software module for real time date remediation in, and validation of, an encapsulation Y2K solution for VAX/VMS systems. Design, build test harnesses for module development, verification. Visual C++ development and test environment, targeted to run under Windows NT/95, ROM-based MS-DOS, and within a VAX driver.
- **Progress Software Corporation**, Bedford, MA. 3/1998 - 4/1998. *Software QA*. Internationalization group QA developer for multi-platform fourth-generation database language products. **I am not interested in further software QA assignments.**
- **Safety Net Solutions**, Salem, NH. 9/1995 - 1/1997, 4/1997 - 8/1997. *Windows software development*. Telecommute (offsite) job. Develop, implement & document major sections of multi-thread ID card printing system. Tasks included design & implement user interface; implement finite-state-machine; design & implement serial interface, protocol, diagnostics, state machine for hot roll laminator & Datacard printer; interface digital I/O boards including installation diagnostics; image compression & encoding; interface Windows Registry, change Registry key security settings programmatically; optimize image merge code (~6x speed-up over library calls previously used); develop 2D barcode library wrapper class. Developed for Windows NT 3.51 and 4.0 using MFC and Visual C++ 2.2, 4.1, and 5.

Web site development:

- **Web Code Sample**, <http://wfredk.com/projects/WebCodeSample/index.php>, 5/2009, PHP/MySQL coding sample application, Web page includes link to specification document, link to request the source code;
- **CFO Rising**, <http://www.dansmalltv.com/CFO/index.php>, 3/2009-4/2009, implement access control system for a video on demand service, optimize Web code and presentation;
- **Photo By Fred**, <http://PhotoByFred.com>, 2004-present, photographic art site whose featured picture is changed daily by a PHP cron script, slide show and calendar reviews of previous images, subscription program (in development) to update subscriber's Windows desktop background each day with the site's latest image through a custom-developed client/server protocol, the protocol also supports dynamically updating marketing messages displayed within the client application, image manipulation tools for simultaneously generating watermarked wallpapers at multiple resolutions;
- **Limited Edition Photo**, <http://LimitedEditionPhoto.com>, 2004-present, a limited edition photo sales site (ecommerce) with pictures automatically added to the catalog by a PHP cron script each day, sample pictures on the site change automatically with each page visit, full shopping cart implementation, including PayPal integration, offline order forms, auction sales (in development), prices incremented based on the number of sales of a print, full administration section;
- **L5 Development Group**, <http://L5Development.com>, 1997-present, a commercial (for profit), privately funded, space exploration and development program featuring an extensive icon-based navigation system with many custom graphics, an online newsletter, a MySQL database-driven space history newsletter automatically published and delivered to subscribers each day at 7 AM, banner swappers, a keyword access system, a MySQL database system for membership data, and online registration and feedback forms supported by internally developed PHP and Perl CGI scripts;
- **FKE Internet**, <http://FKEinternet.com>, 2001-2006, Web hosting service with domain registration provided through integration with an ICANN-recognized registrar's affiliate program;
- **L5 Software Development**, <http://L5Software.com>, 1997-present, commercial software/shareware site with e-commerce support using integrated PayPal credit card processing, online file download operations, online registration through PHP and Perl CGI scripts, MySQL database for customer and order records;
- **StudioLines.com**, <http://StudioLines.com>, 2000-2003, music site with file upload/download, RealServer streaming server, custom e-commerce/shopping cart system, Authorize.net Web services API for real-time credit card processing to purchase tracks (immediate download or compilation CDs), T-shirts, posters, etc., member registration, song, and admin forms, online message system, MySQL database for membership, artist, track, and club info, password-protected admin tools to send emails, for picture validation, for database maintenance, online newsletter, banner swappers, keyword access, built using PHP, Perl, JavaScript, CGI scripts, graphics including Flash development, Windows music validator communicates with remote database server, executes telnet commands and FTP file uploads/downloads, sends email; FreeBSD & Apache system/server setup, administration, secure server (OpenSSL), Sendmail, PHP, Perl, BIND, RealServer, and MySQL installation, upgrade and maintenance;
- **FredLines™ T-Shirts**, <http://FredLines-TShirts.com>, 1997-2003, on-line catalog with over 150 shirt designs and books driven by a PerlShop (shopping-cart script) version customized by L5 Software Development;
- **L5Business.com**, <http://L5Business.com>, 2009-present, "The site for L5 business development", a WordPress-based site, shares installed code with a blog on wfredk.com;

- **wfredk.com**, <http://wfredk.com>, 2003-present, my personal home page, WordPress blog shares installed code with L5Business.com;
- **Changes Wellness and Nutrition Consulting**, <http://ChangesWellness.com>, 2004, diet/nutrition consulting site using PHP and MySQL, email response forms, database driven membership system, resource pages, picture swapper, PayPal e-commerce support, secure Admin control panel, graphic design;
- **Gifts From Brokers**, <http://GiftsFromBrokers.com>, 2004-2005, e-commerce site selling personalized door mats and other gifts to real estate brokers built using PHP and MySQL, secure credit card forms and Admin control panel, order information reports delivered through custom file download;
- **Juliablueyes**, <http://Juliablueyes.com>, 2005-2006, an adult site built using PHP and MySQL, with video clips, photo galleries, a daily journal, site tour, member-written tributes, phpBB discussion forums, e-commerce support through an offshore credit card processor, secure Admin control panel, graphic design;
- **Stop Highway Robbery**, <http://StopHighwayRobbery.com>, 1999-2008, political site to "end legalized highway robbery committed against the driving public," online discussion system and animated graphics.

Commercial software products:

- **ThmIndxr™**, creates HTML index pages and thumbnail images from directories of GIF and JPEG images, Windows NT console application with Registry stored configuration, two dialog-based configuration file editors and a launch application, online Help, User's Guide, and InstallShield setup program,
- **wCapLock™**, Windows message filter that makes the CapsLock key act like a typewriter,
- **TLog™ Time Logging Suite**, time logging software (written for multi-platform portability),
- **KillDupe™**, a Windows console program to search a network to find, report and eliminate duplicate files,
- **DozeCal™**, a dialog based, multi-view Windows calendar application,
- **KeywordGo™**, a CGI program written in C++, provides keyword access to popular pages for Web sites,
- **BannerAds™**, a CGI banner swapper written in C++, with complete online Help, a Windows dialog-based administration utility with many advanced user-interface enhancements, and an InstallShield setup,
- **GetGamae**, a multi-threaded Internet robot to retrieve pictures posted hourly at predefined Web sites, includes a thumbnail preview window, logging operations, remote license monitoring and usage reporting, updates desktop wallpaper, pseudo-random collection simulates a human operator, user interface can be turned off for background operation, includes a complete Help system and an InstallShield installation,
- **MCspider™**, a multi-threaded Internet application that searches the World Wide Web to generate a list of unique email addresses meeting customer-specified criteria, package includes a complete Help system and an InstallShield installation system,
- **SiteMapr™**, a tool for building a Web site map HTML page from its source files,
- **Today's News™**, a suite of C/C++ CGI programs and supporting files in development for creating, updating, and archiving "Today's News" pages on Web sites, with individual articles saved as XML files.

Melexis, Inc., Cambridge, Mass. *Manufacturing Technician*. 8/2009 - 9/2009. Duties: Program automotive camera module FPGAs. Epoxy fill access ports. Camera module testing. Debug test system. Support test data analysis.

Lotus Development Corporation, Cambridge, Mass. *Development Manager*, Cl. 5/1999 - 12/1999. Duties: Analyze customer concept & requirements, design/develop multi-threaded NT console Lotus Notes C/C++ API data mining tool to read search profiles from Notes database, search Web, newsgroup & Notes sources; perform linguistics analysis; generate hit reports when search criteria match occurs, notify profile owners via (Notes) email, network interface through WinInet & WinSock. Custom setup wizard for initial setup, [re]configuration via a property-page dialog window administration utility with a complete online Help system. Dialog-based custom log viewer utility for debugging, also with complete online Help; thread selection using a "tree" display control, the dialog also includes field selection and trace level filtration controls. approx. 39,000 lines of code as of 12/31/1999.

Sensitech, Inc., Beverly, MA. *Program Architect*. 4/1994 - 9/1995. Duties: Full product design, development, concept through finished code: extensible multi-platform GUI application to interface environmental monitoring devices via serial ports, display, store and print retrieved data in graphic and text formats, including printer support, file format design and I/O code, and export to external applications. Develop diagnostic programs for design lab. Developed for Windows using zApp, Greenleaf Comm++, and Visual C++ 1.5 with MFC. Design objectives include support multiple versions (customer, distributor and in-house), and internationalization (early version sent to Japan for to NEC computer and operating system port, program text translated to French). Rewrote Help text to correct technical errors, support new features. Enhancements to Manufacturing Department software for product label generation.

KeySoft Corporation, Williamsville, NY. *Programmer*. 6/1993 - 4/1994. Duties: Full product development from customer design through finished code: Windows appointment calendar system (Forget-Me-Nots, an advertising give-away) using Windows SDK and Microsoft C/C++ 7.0 with MFC, dBase compatibility provided by CodeBase; worked on porting the program to DOS using MEWEL & MetaWINDOW libraries and Phar Lap 286|DOS Extender. Wrote advertising development tools used by both KeySoft and their customers to customize the program. Made significant contributions to product design enhancements, wrote both DOS and Windows installation programs.

Lotus Development Corporation, Cambridge, Mass. *Programmer*. 5/1991 - 12/1991. Duties: programming 8086 assembler, C, and Pascal product enhancements: 1-2-3 for DeskMate, Lotus Works. Implemented landscape printing and laser printers support for DeskMate, corrected several bugs. Lotus Works efforts included clipboard data system design and implementation; user interface and file system debug and enhancement; fixing spreadsheet code; and directory window file viewer code. Used Lotus Notes and Express for e-mail, reporting, and communications.

FKE, Computer Software Designs, Westborough, Mass. *Product development partnership*. 2/1991 - 5/1991. Design and implement TSR database program for medical offices; supervise database development and verification; write user manual; manufacture serialized/copy-discouraged distribution disks. Marketing resulted in a few sales.

Lotus Development Corporation, Cambridge, Mass. *Programmer*. 6/1990 - 8/1990. Duties: Write design specifications to port Lotus 1-2-3 to the Amiga computer system, adapting the existing Macintosh 68000 code. C language programming in a multitasking environment of prototype software.

Lotus Development Corporation, Cambridge, Mass. *Programmer*. 2/1989 - 10/1989. Duties: C and 8086 assembler programming to port Lotus 1-2-3 to Tandy's DeskMate operating environment (graphical window-based user interface). Development of CASE tools used internally in the effort. Successfully completed in time for shipment of the finished program to Radio Shack stores for the Christmas buying season, which was a primary objective.

FKE, Boston, Mass., Mt. Morris, NY, Londonderry, NH, Boston, MA. *Consulting & product development work*. 11/1985 to present. I've written well over 300,000 lines of code (primarily C, C++ and assembler) in this time, in addition to work done in full-time contract positions. I am working on several projects, and plan to continue to do so in my spare time, including: DOS device driver for clock display and sound functions; DOS and Windows graphics image processing software; database tools and programs to support my Web and other businesses. My development work has also included:

Windows program development:

- *GIFPaint.exe*, Windows 3.1 compatible GIF image editing program (in development),

C and assembly programming, FKE-owned character mode MS-DOS software: MKDBFILS™ Essential B-Tree database code generator; FKE_Menu™ menu shell; SignOff™ system access control/email program; Makedoc™ documentation generator; FoxBASE-to-C translator; software development (CASE) tools; GIF file encoder/decoder library; painting/sketch pad program; character-mode window library; menu and editfield libraries; mouse interface library; embedded text editors; C-ISAM database applications (Essential B-Tree, C/Database Toolchest); sound generation routines; DeSmet object-file disassembler; DOS internals work, including support for TSR programs and applications;

FoxBASE applications development: customer tracking and billing systems; condo sales management; and a library database system;

Aclimé Hair Salon, Los Angeles, Calif.: design and implement a "supervisor" program to enable reviews and updates of Essential B-Tree (C-ISAM) customer and order tracking database;

Meta Optimization Systems, Brookline, Mass.: design and implement an installation program for their numerical processing engine, design and implement user interface enhancements;

Information Management Systems, Grafton, Mass.: design and implement a program to add text to scanned form images, and print the merged documents on an HP LaserJet printer;

Auto Info Providers, Ft. Lauderdale, Florida: design, implement customer tracking, billing, and auto database entry & reporting systems. Started in FoxBASE, translated to C to improve copy protection & user interface; network installation, operation & management, user support;

Digital Medicine Corporation, Cambridge, Mass.: design, implement HP-compatible serial communications software for a portable electrocardiogram (EKG) machine, and a text printer driver. Code written in Z80 assembler for a Hitachi 64180-based system. Initial development on DEC Rainbow under CP/M, completed on a PC clone, partially tested using simulation software running under QNIX;

Digital Automation Corporation, Peabody, Mass.: modification and development of Z-80 assembly language programs robotic control systems for semiconductor manufacturing (diagnostics, communications, control functions), C programming under VAX/VMS, including user-interface software for the robotic systems, solids and dynamic modeling programs (graphic display routines, functional models), porting user-interface routines to a PC under MS-DOS, development of dynamic models of systems for motion analysis;

Discount Vehicle Leasing Corporation, Burlington, Mass.: PC network system design, installation and setup lease management office's Lantastic network (originally installed in Bedford, NH, supervised move to Burlington and re-installation); customer support and training for applications software; software installation;

Theta Technologies, Braintree, Mass.: hardware and software design and implementation of programmable pump controller, including PC board and silk-screen design, stepper motor driver, serial interface, and customer-supplied user-interface definition, system integration, C language program for controlling the pump from a PC, designed the communication protocol for the serial interface;

Comtron International, East Boston, Mass.: redesign of coin-operated lottery advisement game, including user interface updates, power supply design, printer controller design and implementation, PC board design review and correction, accounting report definition and coding, RAM battery backup with detection of battery failure;

system design of battery-powered 80C51 modem unit for an MIT researcher (hardware/software design);

system integration of PC-compatible computers;

operation of the **FKE SpaceBoard BBS**, a space-development information center (temporarily out of service).

General Instruments, Westwood, Mass. *Test Support Engineer*, 11/1986 to 12/1986. Duties: PL/M-86 and 8086 assembly programming and debugging of multi-processor real-time SONAR signal processing system, including interface to VAX running VMS. Job entailed travel to Japan for shipboard testing.

Analogic/MEL, Inc., Danvers, Mass. *Programmer*, 8/1986 to 9/1986. Duties: 8344 [8051 assembly language] programming of protocol conversion board in SDLC-based medical system. (Unix programming environment).

United Computers of New England, Boston, Mass. *Service Manager*, 6/1986. Duties: System integration, network configuration, installation and maintenance, customer microprocessor system fault analysis, design, develop and implement repair tracking system.

Ideas, Inc., Norfolk, Va. *System Engineer*, 5/1986. Duties: PL/M-86 code development and analysis for FAX image processor system using the iRMX operating system and an 80286 based processor board.

Burroughs Corporation, Rochester, NY. *Software Engineer*, 4/1985 to 10/1985. 8051 assembly language programming. Design, implement, debug user interface unit as a real-time, multi-tasking system, using prototype hardware and ICE-51. Design, implement RAM-based data recording system and report generator microprocessor for integration in product's software package. Design, implement inter-processor communication protocol. Software documentation and technical writing. Write production test software for

system PC boards and components. Enhancements to ISIS operating system including an Okidata printer interface program (8085 assembler). MDS-235 development system maintenance and installation. Installation of Winchester disk units into MDS systems.

General Railway Signal, Rochester, NY. *Test Engineer*, 6/1984 to 1/1985. Duties: 8085, 8086 assembly programming of real-time test code using VMS-based development tools, C programming on IBM PC/XT, design test hardware for microprocessor systems, technical writing.

Moscom Corporation, E. Rochester, NY. *Programmer*, 5/1984. Duties: 6301 assembly programming of telephone cost management system in a Unix/C environment, 68000 programming (C and assembly).

Xerox Corporation, Webster, NY. *Engineer*, 2/1983 to 1/1984. Duties: engineering document scanner development, including high-speed digital system design; digital and analog video design analysis and debugging; system debugging and analysis using ICE-85, ICE-86, Tektronix DAS-9100; documentation; examining timing constraints; PL/M and assembler programming of real-time user interface and machine control routines; computer-aided schematic drafting.

Geneseo Electronique, Geneseo, NY. *President, Chief of Research & Development*, 4/1982 to 1/1983. The company originally started to build arcade-style video games. During two partnership changes, the target product was changed to a single-board computer, then to an inexpensive home computer. The home computer design was breadboarded and proceeded to the "search for funding" stage, the company folded due to a lack of working capital.

Engineering functions: microprocessor system design (hardware [Z8000, 8085 based] and software [assembly language programming: bootstrap code, BIOS for CP/M, device drivers, BASIC interpreter]), PC board layout, breadboard construction, component specification and selection, schematic drafting.

Management functions: advertising planning, negotiations with venture capital groups, banks and vendors, office supervision, financial projections, wrote business plans and policy manuals.

Other duties: space planning for office and production facilities, office construction, stationery and logo design.

Xerox Corporation, Henrietta, NY. *System Design Analyst*, 11/1981 to 4/1982. Duties: Motorola 6800 disassembler, design analysis on laser printer system, technical writing: wrote a manual with theory of operation and detailed operating instructions, recommendations for future designs.

Trio-Tech International, Burbank, Calif. *Software Engineer*, 3/1980 to 9/1980. Duties: flow charts, 8085 assembly language programming, hardware debugging, select, use Hewlett-Packard logic analyzer, reduced ROM requirements by 33% from original design through code compaction, test procedures, technical writing including contributions to user's manual and program documentation.

Techtran Industries, Rochester, NY. *Junior Engineer*, 8/1979 to 3/1980. Duties: 8085 assembly language programming, debugging with Tektronix emulator system, digital design, selection of and interface design for 20-column printer, breadboard and troubleshooting of A/D converter system, RT-11 assembly language programming, installation and maintenance of 10-Mbyte disk system in PDP-11 minicomputer system, TECO programming including routines for automatically updating software progress reports, inspection and correction of PC board artworks, schematic drafting, test technician in engineering and production.

W. H. Nichols Company, Waltham, Mass. *Relay Logic Designer*, 4/1979 to 6/1979. Duties: design relay controls for automatic machine tools using ladder logic. First shift, concurrent with Applicon job below.

Applicon, Inc., Burlington, Mass. *Subassembly Test Technician*, 4/1979 to 6/1979. Duties: testing CAD system components. Second shift, concurrent with W. H. Nichols position above.

G & S Systems, Inc., N. Billerica, Mass. *Technician, Engineering Aide*, 8/1977 to 4/1979. Duties: installation and field service, troubleshooting and repair I/O boards, debugging computer interface and AN/UYK-7 computer simulator, tech writing, wire and parts list generation, electronics design, schematic drafting, wrote PC board design and manufacturing specifications, breadboard construction and checking, inspection and correction of PC board artworks, drawing and revision file maintenance, engineering-drafting department liaison, supervised equipment calibration, interfaced with vendors, rewrote quality control procedures to reflect current requirements.

Foxboro Corporation, Mansfield, Mass. *Senior Wiring Technician*, 5/1977 to 8/1977

DeLaval Separator Company, Hyde Park, Mass. *Expediter*, 2/1977 to 5/1977. Duties: part and materials expediting during plant closing. All machines were shipped before the scheduled closing date.

Northrup Corporation, Norwood, Mass. *Assistant Production Control Manager*, 11/1976 to 2/1977.

Data Printer Corporation, Cambridge, Mass. *Mechanical Assembler*, 3/1976 to 10/1976.

Rochester Instrument Systems, Rochester, NY. *General Assembler*, 5/1975 to 9/1975.

MIT Space Propulsion Lab, Cambridge, Mass. *Research Assistant*, 9/1973 to 5/1974.

Education

Geneseo Central High School, Geneseo, NY. Graduated valedictorian 1973; studies included math, science, mechanical drawing, shop, typing, and programming

Massachusetts Institute of Technology, Cambridge, Mass. fall 1973 - winter 1975. Specified major: Aerospace Engineering. Studies included electronics, solid-state chemistry, programming

Shawsheen Valley Technical School, N. Billerica, Mass. 9/1978 - 5/1979 (nights), certificate in photography

School of Experience, spring 1975 to present: I started as an electronic assembler in 1975, and taught myself the industry, rising through the ranks to the level of engineer, and got more into programming as employers requested my skills. I've been programming since before there were Computer Science degrees available, and I believe my real world programming experience should be considered at least equal to receipt of a Computer Science degree. My businesses and other life experiences have given me a solid understanding of business operations, many potential problems that may arise, and an awareness of how to develop solutions to them. I constantly study, at work and in my spare time, to keep my knowledge current, and to stay informed about relevant issues.

References available on request

April 11, 2011