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RESUME

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Objective

Design and development of complex systems that require expert architectural, design, and implementation skills. Special interests include operating systems, embedded computer systems, object oriented design, and real time systems.

Experience Summary

Operating Systems UNIX (Linux, Mac OS-X, Solaris, BSD, AT&T). iPhoneOS. Wind River VxWorks. Enea OSE Delta Safety Certified Realtime OS, VRTX. DEC VMS, TOPS-10.

Computers Intel x86, PowerPC, Arm, TI DSP, HP PaRisc, Intel i860 (including INTEL PARAGON Super computer). Alpha, Motorola 68040,30,20,10,00 processors. VAX 8600/780/785/730. DEC PDP-10, PDP-11, PDP-20. IBM 360 and 370 series. UNIVAC 1100 series.

Languages C++, C, Objective-C, Java. Assembly languages: PowerPC, Intel i860, Motorola 680x0 series, VAX-11, PDP-10, PDP-11, BAL. Fortran-77, Lisp, Algol, TECO.

Employment History

Self
Harvard, MA
Jan 2010

Designer / Developer - iPhone Application
Designed/developed an iPhone application "iLogbook" for pilot logbook entry. The program is used by pilots to store flight data at the time of flight, and then later to export it via email or the built in web server. It uses an SQLite database to store configuration and flight data. The iPhone location manager is used to access a built in database of all public/private airports + heliports in the United States. The application is a little over 18,000 lines of code, and was approved by Apple on Feb 5th, 2010.

Veritude
Cambridge, MA
Oct'09 – Dec'09

Consultant - iPhone Developer
Developed an iPhone prototype to talk via XML to the companies existing database product. Work involved developing User Interface, HTTP/XML server protocols using the DOM style XML parser I previously developed. The application presented a hybrid display of both UIWebView embedded web displays and native iPhone user interface elements. Additionally, as a stretch demonstration implemented a dynamic iPhone user interface technology allowing the server to push XML descriptions of user interface elements to the phone, and the phone dynamically building the interactive user interface on the fly.

Dement Construction
Jackson, TN
Apr'09 – Jul'09

Instructor - FAA Certified Flight Instructor
Developed course syllabus and conducted both ground and flight training of two pilots - one ab-initio to Private Helicopter Pilot standards, and one ATP Multi-Engine (Citation Jet) rated pilot to Private and then Commercial Helicopter Pilot standards. Worked with client to codify best practices with respect to maintenance and operations of the helicopter make/model, and on the job training with operations at active construction sites.

Soft Artisans
Watertown, MA
Feb'09 – Apr'09

Consultant - iPhone Developer
Developed an iPhone technology demonstration/prototype for a company with mobile handset applications. Work involved developing User Interface, database, and HTTP/XML server protocols. Integrated and extended a DOM style XML parser, automatic code coverage testing, multithread execution, and demonstrated SQL database performance. Ported about 15,000 lines of C# to Objective-C.

Avid Technology

Consulting/Senior Principal Engineer, Architect

Tewksbury, MA
Oct'04 – Oct'08

Worked as an architect in the Video Business Unit, and as a Consulting/Senior Principal engineer in the Hardware Interfaces group in Video/Film editor development.

Video Servers

Lead a small team working on video servers. Debugged the existing FreeBSD based server *(Airspeed)* which was acquired through a purchase of Pluto Technologies. Designed the architecture for the follow-on server code named *Blade Runner*. Project was cancelled when Avid acquired Pinnacle which already had a competing server product.

Macintosh Porting

In the Media Composer editor development group performed the re-porting of the Media Composer code base back to the Macintosh with one other engineer. This involved over 65,000 source files and 2+ million lines of code and got Avid back into the Macintosh business after a several year hiatus. In 2008, used the *Agile* development process to rapidly deliver a Macintosh port of Pinnacle's Pixie software licensing system. Personally ported approximately 50,000 lines of MFC code to the Macintosh and demonstrated both indirect and direct (web server) activation of software licenses for the DeMille-B release of Media Composer.

Editor Hardware

In the Hardware Interfaces group, worked on Nitris DX (*Hagrid*) which was a low cost PCI-Express external I/O box which used the VDM3 (Virtual Device Manger) interface technology, similar to high end Nitris finishing systems. Worked on the driver, driver interface, and firmware support software.

Advanced Development

Worked with two senior hardware engineers on a technology demonstration project (*Agile Codec*) which utilized a Stretch Inc. S6 embedded computer system (on a PCI-Express card) to implement the decode functionality of the HD DNX codec. The project demonstrated that it was feasible to implement a dedicated hardware CODEC with better time to market than with an FPGA, and was possible to implement many different CODECs with a single piece of (real-time context switched) hardware.

Seranoa Networks, Inc.
Boxborough, MA
Jun'02 – Oct'04

Consulting Engineer, Architect

Worked with 2 other senior engineers (1 being my initial boss) to lead a team of a dozen software engineers in a startup environment producing a Layer 2 Internet switch targeted at ISPs. Ported Linux to 5 custom boards. (The boards actually have two processors - a PowerPC 8260/8270, and an ARM [IXP1200], both running Linux). Designed and implemented a custom embedded C++ SNMP database (~10,000 LOC) that is used as the main control plane transport for the CLI, Control Plane, Protocols, etc. Designed and implemented the embedded portion of an XML based licensing system. Helped support/develop PPP/MLPPP protocol, control plane manager, various system level monitoring / fault handling mechanisms, build system. Architected the process monitoring/restart facility. Drivers written/modified include (Intel)flash, custom watchdog, Ethernet, boot args, 12 port GigE Ethernet switch. Merged/implemented PCI support for 8260 PPC Linux kernel, debugged PCI hardware.

Mercury Computer Systems, Inc.
Chelmsford, MA
Jan '00 – Apr '02

Software Architect, Senior Developer

Lead the development of all Wireless Communications Business Unit engineering projects, targeting cellular base stations for advanced signal processing techniques. Projects included MCW0, MCW1, Maverick, MavLite, MCW-DS1.

Project Leadership

Assembled a team of 8 software engineers, established software standards and development methodologies, including design and code standards, software review standards and checklists. Designed the source tree layout and *make* system for the WCG class libraries. Taught C++ and OO design to most of the software team. Developed project goals and milestones, and worked with engineers to meet them. Consistently met project milestones and goals on or before deadlines.

Software Architect

As software architect, designed the structure of the WCG class libraries, defined the core classes and subsystems, and worked with each engineer on their designs. Defined the hardware architecture of MCW1, Maverick, MavLite, and MCW-DS1.

Project Summaries

MCW0 was a SBC (Single Board Computer) purchased from EST for software debug while MCW1 was still in layout. We had the WCG class library + VxWorks all running on the embedded PPC8240 before MCW1 hardware was debugged. This allowed a very

short integration time after MCW1 became available (software was ported in a few days).

MCW1 was a 5 CPU demonstration board, with high availability features, 1 PPC8240 CPU running VxWorks, and 4 PPC7410 (G4) nodes running MC/OS. It included Ethernet, Flash File System, PCI->PCI bridge, PCI->Switched Fabric bridge, NVRAM persistent object storage, time-of-year clock, and watchdog timer.

Maverick was basically MCW1 plus 2 PMC daughtercard sites squeezed on to a CompactPCI 6U board. MavLite was a prototype to allow software integration while (the very difficult) hardware layout continued. Maverick software was finished on time, and led to several time critical design wins.

MCW-DS1 is a Texas Instrument 6416 based technology demonstration board targeted at Northern Telecom. Unlike previous projects Mercury has done with DSPs, rather than try to port MC/OS to the DSP, I instead chose to implement a portable version of the Mercury data exchange API which could be easily ported to different operating systems, allowing us to run TI's DSP/BIOS, Enea OSE, or even bare hardware (no embedded OS). I worked with the hardware engineers to define how the FPGA would integrate with the DSP DMA engine, and what the FPGA programming interface would look like.

Northstar Technology
Acton, MA
Oct '97 – Nov '99

Software Architect, Senior Developer

Lead the development of a safety critical FAA DO178B certified software project for a GPS/WAAS Precision Approach piece of avionics gear. This was the first large team avionics project at Northstar, and the first to be developed under the FAA DO-178B Software Certification Standard. The project was developed as a safety critical piece of gear because hardware or software bugs can lead to loss of the aircraft and the occupants.

Project Leadership

Assembled a team of hardware and software engineers. Fullfilled a leadership role in design of the GUI, creation of standards, development and test plans, selection of automation for requirements definition, source control, IDE/compilers, JTAG debug tools. Worked with the hardware engineer to design the prototype hardware, and with the software team to define the software architecture. Worked with the software team to develop software design processes, requirements capture, and creation of design documentation. Worked with the hardware team to develop an architecture to meet P(hmi) requirements of the FAA.

Software Architect

As software architect, lead the definition of the software architecture, including the selection of Enea Data Systems OSE Delta safety certified OS. Also worked with the applications team to define the architecture of a C++ based hard realtime system implementing a GUI, navigation subsystem, moving map, and analog instrumentation. Additional key contributions in developing strategies to deal with the fact that C++ had not been used extensively in FAA safety critical applications, and the object oriented nature is in conflict with standard practices in this field, such as use of static memory allocation.

Senior Developer

As a senior individual contributor, ported OSE Delta to the Motorolla YellowKnife PowerPC 603 board, and then again ported it to the PowerPC 8240 board of our own design. Debugged the board with the hardware developer - including the Processor/ECC Memory/Flash, PCI I/O bus, PCI to PCMCIA bridge, I2C bus, PCI Graphics chipset. Wrote a 2 level bootstrap system, ported the SanDisk PC File System for use with the PCMCIA ATA Flash Memory Cards. Worked with other developers to specify the HDLC link to the front panel.

Augment Systems, Inc. (startup)
Westford, MA
May '96 – Oct '97

Senior Member of the Technical Staff

Took a leadership role in getting the Fibre Channel file server ready to demonstrate at the Seybold show, and then in getting the product ready to ship. Delivered the Beta system 1 week early, despite an aggressive schedule. Designed the source tree and source control, build system, wrote BSPs and ported VRTX to the 68030 motherboard and 68040 daughterboards, designed the multi-processor extensions to the operating system, the I/O system Partition Manager, embedded filesystem runtime environment, and coredump facility. Implemented motherboard code to diagnose, boot, and monitor the

daughterboards. Multi-processor extensions allowed inter-processor event flags, queues, synchronized time, cross processor interrupts, and object name services. Supported watchdog timer, front panel display, and UPS battery low warning system. Worked with the hardware engineer to characterize memory and I/O ASIC bugs.

Locus Computing Corporation
Burlington, MA
Mar '93 – May '96

Consulting Member of the Technical Staff
Worked in a support role on the TNC port to the Intel Paragon super computer, fixing bugs and adding support for a cluster-wide real time clock.

Major contributor to adaptation design, designing the port of TNC to a major hardware vendor's Unix operating system. Ultimately responsible for approximately 1/5 of the 1,000 page design document, detailing designs for porting of the TNC distributed file system (CFE) including the CFS stacked filesystem, token manager, and cluster mount service. As part of a subsequent design study, designed the streams, pipe, and Unix domain sockets adaptation.

Sequoia Corporation
Marlboro, MA
Nov '91 – Dec '92

Senior Consulting Engineer
Assigned to the S1000 project. The S1000 was a substantially different architecture from the previous Sequoia systems, supporting multiple different processor chips, with an interconnect structure resembling a redundant hypercube.

Stardent Corporation
Concord, MA
Nov '90 – Nov '91

Senior Consulting Engineer
Architected and implemented Unix operating system extensions. The 800ex was an OKI 7300 enhanced with 2-4 Intel i860 RISC microprocessors. Extensions included full virtual memory support for the graphic accelerator i860 processors including an embedded mini-kernel, virtual pixmaps, snoop space support (doubled pixmap to frame buffer transfers rates), full debugging support. Support was also included for dumping page tables, logging page faults, and logging exception frames.

Alliant Corporation
Littleton, MA
Aug '87 – Nov '90

Senior Consulting Engineer
Architected and implemented the FX/RT™ realtime extensions to the Alliant Concentrix™ 4.3BSD Unix kernel. This included a fixed priority preemptive scheduler, frame scheduler, semaphore and event mechanisms, and I/O device mapping facilities, I/O devices to perform DMA into user programs, and user mode ISRs.

Cognex Corporation
Needham, MA
Nov '86 – Aug '87

Principal Software Engineer
Major accomplishments include work on completing the Cognex 2000, a single board, 68000 based vision processor.

MASSCOMP (startup)
Westford, MA
Jul '82 – Nov '86

Principal Software Engineer. Member of original engineering team.
Worked on all components of Unix, except compilers. Major projects included OS support for the Graphics Processor, mass storage, GPIB IEEE-488, a custom editor, a font editor, diagnostics, disk partitioning editor, RS232 multiplexer driver, disk formatters.

Digital Equipment
Marlboro, MA
May '79 – Jul '82

Senior Software Engineer, Engineering Systems Group.
VAX/VMS Systems programmer responsible for interfacing graphical devices including VS-70 Stroke Refresh system, VSV-11 Color Raster system. Developed 11C03 product high speed Tektronix mux.

ADP First Data
Waltham, MA.
Aug '77 – Jun '79

Operating systems programmer assigned to the National Institutes of Health/CBIH PROPHET computer system. Duties included operating system development and maintenance on a government DECsystem-10.

Academic History

Worcester Polytechnic

Completed two years of a Bachelor of Science degree in Computer Science. Major

Institute educational emphasis on software design of operating systems. Worcester, MA.