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EDUCATION
University of Washington – BSEE and a lifetime of passionate engineering experience

KNOWLEDGE AREAS
Commercial product design in DO-178B, and CFR 21 Part 820 high reliability design environments, Communications, IPv4 networking, Linux/LAMP, Medical Ultrasound, Heart Monitoring and Defibrillation, Non-invasive blood pressure measurement, manufacturing automated test.

SKILL SUMMARY
- *Hardware:* Designed, developed, analyzed board electronics for high performance medical applications. Designed and developed microprocessor hardware/firmware for medical applications. Environments include Altium Designer 17, Circuit Studio 1.4, Eagle CAD 7, Xilinx ISE 14.7, OrCAD CIS (Windows), Viewlogic Powerview (Sun OS), EIA RS-232 serial, PCI 2.2 bus
- *Software Development:* Experienced in C/C++, Design Patterns, Atmel ASF, Atmel assembly, Python, Doors DXL scripting, ARM 7, Windows, Linux, uClinux, VxWorks, microcontroller programming with tools such as Visual Studio, GNU C, GDB with DDD, MS Excel/Word Macro. Solid understanding of overall software development processes. Also, experienced with software CM processes and tools such as GIT, Subversion (SVN), ClearCase, WebIssues, Perforce, JIRA, ClearQuest and Linux/Unix/Windows development, integration environments. Linux Admin (development) with a 30+ device IP network for 15+yrs, QoS, VoIP, embedded remote debug (DDD), Wireshark, Asterisk, numerous other tools/applications too large to list.
- *System Development:* As an engineering lead, participated in the design and development of a Win2K based high-end ultrasound system, and development for a 22K line C/Assembly based automated test system. DOORS, ARINC 615A
- *Program Management:* Project lead for several embedded applications/features. This involved requirements gathering and analysis, task breakdown and management, scheduling, implementation, integration and verification.
- *Technical Writing/Proposals:* Authored numerous technical documents including: software architecture/high-level designs, hardware specifications, user's manuals, data analysis reports and process documents. MS Office, LibreOffice/OpenOffice, FrameMaker tools.
- *Personnel Management:* Developed excellent organizational, communication and personnel management skills while mentoring engineers, supervising personnel and managing projects.

RELATED EXPERIENCE

EKOS
November 2015 - May 2016
- Performed stripline/transmission line analysis for 400MHz DDR2 ARM PCB transmission loss estimation
- XJTAG implementation and coverage using Altium Designer
- I2C/SMBus redesign for Lithium Battery pack
- Analyzed Lithium Battery pack electronic design changes for IEC 62133-2012 recommendation
- Improved DFT while analyzing 120W Boost Switching DC-DC Supply
- Update SW Architecture Design Pattern and State Diagram documentation
- Used Perforce revision control, bug tracking, and WebIssues bug tracking.
- Debug C/C++ code in GNU ARM Eclipse based environment
- Introduced OOVAIDE C++ analysis IDE tool to EKOS development environment.

Living Computer Museum
February 2015-Aug 2015
- Designed LED replacement console panel for mainframe using Eagle 7.3 schematic/board layout hierarchical design. Geekwire Article link (clickable link) Finished assembly is mounted using custom designed 3D MakerBot printed plastic circuit board/lamp holder.
- Implemented Virtual Card Reader mainframe hardware using VHDL in Xilinx ISE 14.7 environment to bridge mainframe electronics to PCI interface for custom PC based C++ app.
- Created VHDL Virtual Card Punch Output electronics using approach similar to Virtual Card Reader.
- Introduced Git SCM into LCM development environment. LCM Design IP storage is hosted in GitLab.
- Developed needed, no longer available IBM SLT/SMS Connectors using Eagle CAD, and 3D printer.

Stepwise Solar
January 2012-Nov 2014
- Completed Atmel ASF "Time Critical Applications" and "Low-Power System Design with Atmel MCU, Wireless and Touch Solutions" programming classes using SAM4L and AVR XMEGA-A3BU platforms. Completed Edmonds Community college business course. Setup OpenSUSE 12.2 x64 Linux; Asterisk 11, Postfix email, GIT and SVN revision control, Mantis bug tracking, LAMP stack secured with Apache 2048-bit certificates and SSH on AMD FX-8120 and Phenom T1100 hardware to support expanding engineering hardware/software product development and business infrastructure resource service needs. OrCAD SPICE Modeling and circuit design. Atmel Studio 6 C/C++ development.

Sagem Avionics
February 2011 – December 2011
- DO-178B work on the ARM 7 TDMI-S based NIU4X product. JIRA/SVN development environment. Excel macro NIU4X product configuration tool (Motorola S-Record output) to remove need for compiler tools in product sustaining and production. Solid HW background helped with this effort.

Stepwise Solar
January 2009 – February 2011
- Phase I - Research for markets, technologies, strategies, requirements, infrastructure. Phase 2 - Design electronics schematic, PCB layout, and C/C++ software for a solar application. Electronics include an embedded Atmel processor for power control electronics.

MythTV.org
September 2009
- Assembled, debugged, and installed MythTV HD recorder under OpenSUSE 11.1 x64 on an Athlon 4000+ X2 system using a Hauppauge 2250 Dual channel TV card. This system provides two DTV channels record/view, commercial skip capability, and networked programming for other viewing front-ends on the local network. This system replaces two analog TV Replay 5040 NTSC units on Comcast cable.

Honeywell
Redmond, WA – November 2007 through November 2008
- Created system, hardware, and software specifications for weather and traffic radar using DOORS requirements tool. Maintained and enhanced DOORS DXL scripting for daily controlled requirements interchange with overseas partner. My primary focus included system hardware specifications and

ARINC 615A-2 Software Data Loader Using Ethernet Interface. Product application is for both military and civilian aircraft. To accomplish this required a team effort with other system and design engineers.

Redmond, WA – June 2007 to September 2007

- Responsible for finding and solving a difficult to repeat embedded system bug causing an Intel processor GP Exception. Task required working with senior staff and significant lab time analyzing Intel bus cycles to locate an Interrupt pragma bug in the commercial C++ compiler used to produce product object code. This design assignment completed successfully after providing technical knowledge used to complete software release documentation requirements in a DO-178B design environment.

Sonasearch

Redmond, WA – September 2006 to December 2008

- Complete design of research sonar software for a Windows MFC application for production field use. This task required knowledge of C++, MFC, Hardware design, operating in a multi-threaded environment.

Honeywell

Redmond, WA – March 2005 to August 2006

- Development of DO-178B Structural Coverage Analysis Testing Tools for TI TMS320C6713 based product. Development used Microsoft C/C++, Python, and Excel/Word VBA Macro's in a Cygwin environment to accomplish task.

Independent Study

Bothell, WA – November 2004 to February 2005

- Xilinx ISE Embedded Development Kit – VHDL 32-bit soft processor system on a Spartan-3 FPGA chip capable of running uClinux with hardware and software debug tool support.

Infinium Labs – On demand gaming set top box

Seattle, WA – Contract Project Engineer, May 2004 to October 2004

- Realtime Control Software – Developed security and realtime interface requirements and software code for Atmel ATMEGA32-16PC RISC processor. The project tools were GNU C and AVR native assembly.
- Security and Console Electronics – Complete missing microcontroller and FPGA hardware design. Then integrate existing display drive electronic design with new PC platform design.
- Independent study of Intel south bridge LPC bus.

Siemens Medical Systems Inc. Ultrasound Group

Issaquah, WA – Contract Engineer, June 1996 to May 2003

- Continuous Wave and Steerable Continuous Wave Doppler Ultrasound – Software feature lead for responsible for ultrasound requirements, design, preliminary schedule, and implementation/code.
- Designed board for high speed 100+ channel A/D capture subsystem. The same board provides stable differential clocks and bias signals for the rest of the system.
- Real-time control of individual ultrasound transmit channels – Developed approach and software to provide functionality in a normally functioning ultrasound machine. This 10-week effort added new user interface and low level hardware control software with supporting requirements documentation to an existing system.
- Responsible for coordinating single board product design. Coordinated efforts of 4 senior design

engineers. Performed analysis for board high speed bus designs. Debugged FPGA PCI implementation for a single board product.

- Responsible for introducing and training newly hired software talent to existing product development tools, environment and practices.
- Implemented system wide state save and restore memento pattern using C++. The pattern maintains data encapsulation for an objects internal state while allowing a calling process to later restore an objects internal state.
- Completed implementation and review of FDA regulated Ultrasound transmit power software subsystem.
- Developed a specification to describe an OEM external customer interface for an ultrasound image and screen capture subsystem. The specification was used for in house software development after verifying it met customer needs.
- Enhanced Worst Case Search tool for semiautomated transducer acoustics measurements using Microsoft C++. Updates added specified new functionality and repaired programming oversights. Converted WCS tool to a DLL. Repaired event processing communication across programming space and multithread boundaries.
- Created “CIA Programmers Guide” documentation for on site programmer reference and training.
- Implemented many ultrasound control algorithms to control an ultrasound machine using C++.
- Created TIA-602, Multitech and Hayes modem capability for a VxWorks serial driver in a Motorola 68060 based embedded system. Development environment included the Clearcase revision control system.
- Developed new assembly/C firmware for an embedded ADSP21020 processor. Tests using the firmware are developed in a Motorola 68060 C++ environment under existing proprietary user interface software.