Matthew E Cross

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OBJECTIVE To obtain a position that utilizes my skills as an embedded and system level software engineer.

EXPERIENCE

<company name withheld>, Littleton, MA

10/07 – present *Consulting Software Engineer*

- Investigated and evaluated two competing multi-core MIPS network processors to discover which would work better in our application.
- Designed and implemented a prototype ASN Gateway data path that is responsible for forwarding packets between GRE and IP/IP tunnels.
- Designed the fast path forwarding architecture for the product.
- Implemented a virtual interface layer to allow the distributed processors a local view of all interfaces in the chassis.

iRobot, Burlington, MA

08/03 – 09/07 *Senior Lead Software Engineer*

- Ported iRobot consumer division's proprietary language to the Freescale HCS12 processor.
- Contributed heavily to the Roomba Discovery series which was the first shipping product in iRobot to use the HCS12.
- Led the project to develop the firmware for Scooba, a robotic floor washer. The firmware was implemented in iRobot's proprietary language which has a Lisp-like syntax and a compiler written in Lisp. The firmware was based on the Roomba firmware, but enhanced to handle the unique challenges of Scooba. Some of the new features include: an automated mobility test, a greatly improved charging algorithm, and smooth wall following.
- Led the team developing the software for ConnectR, iRobot's forthcoming consumer telepresence robot. This project involved coordinating with teams around the world and with several vendors to build a complex product in a short amount of time. I led the choice of processor and the design of the system, gave direction to the electrical designers, oversaw the vendor that developed the control application, and led the small software team that integrated the software on the robot platform. The system ran embedded Linux and third-party VoIP software on one processor, and iRobot's proprietary control software on another processor.

Revivio, Lexington, MA

07/02 – 08/03 *Principal Software Engineer*

- Designed and implemented methodology for communicating information about incoming IO requests in a storage product. Implemented a shim layer to go between a Fibre Channel target mode driver and the rest of our system in an RTLinux kernel module.
- Designed and implemented buffer management for a large clustered storage product as a Linux kernel module and a user mode library.
- Evaluated InfiniBand solutions for a clustered storage device, and implemented a library to simplify access to the subset of InfiniBand features our product would use.

ADC Telecommunications, Westborough, MA

(formerly Broadband Access Systems, acquired by ADC in 09/00)

05/01 – 06/02 *Consulting Engineer*

- Continued advising on the design of new features, both hardware and software.
- Designed packet flow for next-generation POS OC-48 module. Features include IPv4, IPv6, MPLS, and QoS.
- Debugged & fixed critical issues in the Cuda 12000 including microcode forwarding problems and issues at customer sites.
- Ported a large body of C and C++ code from a Pentium processor to an Intel XScale processor. In the process of debugging this I discovered many hardware bugs in a PCI interface FPGA, and assisted the designer by providing tests and logic analyzer traces of the failures.

05/00 – 05/01 *Manager, Software Engineering*

- Managed a team of six software engineers developing microcode, drivers, and diagnostics for the Cuda 12000 CMTS (Cable Modem Termination System) router.
- Advised on the design of many new features.
- Mentored engineers in my group and in other groups.

02/99 – 05/00 *Senior Software Engineer*

- Ported ethernet driver for Intel's (formerly Digital's) 21143 to work with internal IP stack.
- Implemented transmit side microcode in IXP1200 network processor simulator.
- Working with a software engineer at Intel, ported VxWorks to IXP1200.
- Debugged IP forwarding microcode on real hardware.
- Investigated and implemented performance enhancements to our IXP1200 microcode.

Sun Microsystems, Inc., Burlington, MA

02/97 – 02/99 *Software Engineer, Workgroup Server System Software*

- Led a small team that designed and implemented a remote system control feature (RSC), consisting of a PowerPC MPC823 running VxWorks embedded in a 2 CPU Sun server. RSC supports environmental monitoring via I^2C, 10baseT ethernet, TCP/IP, 3 serial ports, PPP, SNMP, TAP and SMTP.
- Designed the firmware for RSC and implemented approximately 70% of it, as well as a large portion of a server-side administration utility. Assisted the hardware engineers in debugging the hardware design.
- Implemented bug fixes to the Solaris PCI support for UltraSPARC systems.
- Implemented an internal portion of CPU hot plug in Solaris based on an existing platform-specific implementation.
- Responsible for core kernel support for a new generation workgroup server. Directly responsibile for updating PCI support and debugging Solaris on a software simulator and a hardware emulator.

Stratus Computer, Inc., Marlborough, MA

04/94 – 02/97 *Software Engineer, VOS Kernel Group*

- Contributed to the early bring-up of VOS on Stratus's Continuum product line, a large NUMA SMP system based on Hewlett Packard's PA-RISC processors. Isolated many difficult operating system bugs and implemented fixes.
- Assisted the hardware team in debugging problems with Continuum's major ASIC.
- Designed and implemented bug fixes and enhancements to the VOS operating system.
- Involved in the design of a fault-tolerant Pentium-Pro based machine. Goals included: board-level integration, Windows NT compatibility, low cost. Responsible for BIOS implementation.

The Real-Time Intelligent Systems Corporation, Worcester, MA

11/90 – 04/94 *Software Engineer*

- Developed a distributed real-time message based multi-tasking operating environment for DOS, Windows, and a variety of UNIX platforms including SunOS 4.1, Solaris 2.3, SGI Irix, DEC MIPS Ultrix, and DEC Alpha OSF/1.

Stratus Computer, Inc., Marlboro, MA

5/90 – 10/90 *Programmer, CASE tools group*

- Designed and implemented a utility to generate a makefile from an executable program. This utility was written in C and ran on VOS.

EDUCATION

Worcester Polytechnic Institute, Worcester, MA

Bachelor of Science, Computer Science, 1993

- Senior Project: *TCP/IP for Minix.* Working with two other students, implemented a subset of TCP/IP on Minix, a small UNIX-like operating system.

LANGUAGES C, C++, Lisp, Scheme, Pascal, Lex, Yacc, PL/1, HCS12 Assembler, PowerPC assembler, SPARC assembler, 80x86 assembler, PA-RISC assembler, ARM assembler, and IXP1200 microcode. Familiar with Python, Perl, Shell script, Java, Ada, DEC Alpha assembler, MIPS RISC assembler, Motorola 68k assembler, and Intel i860 assembler.

OPERATING SYSTEMS MS-DOS, UNIX (Linux, SGI Irix, SunOS, Solaris, Ultrix, Ultrix MLS+, OSF/1), Windows (3.1 through XP), VxWorks, and Stratus VOS.

References available upon request.