Charles G. Rush

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OBJECTIVE

Software Engineer charged with the research, design, and development of products on the cutting edge of technology.

LANGUAGES AND TOOLS

C/C++, QNX, ASTERIX, WindRiver IxWorks (I2O OS based on VxWorks), Tornado, I2O 2.0, Windows Drivers, NuMega DriverWorks, Microsoft Visual C++, Perforce, PVCS Version Manager and Tracker, JIRA, Solidworks PDM, UNIX, CHAPWARE, GE RWS, PLM86, ASM86.

HARDWARE

SRC *LCMR*™/*LSTAR*® Custom Radar hardware, Northrup Grumman LN270 INU, EO Imaging positioner control, camera control, and video tracker hardware, Spectrum Analyzer, INTEL 80303, Custom image acquisition and display board with primary and secondary PCI bus and 4 Xilinx based PCI devices (IAPDB). Custom PCI image acquisition board (IAB), PCI memory card (IMB), PCI image display card (IDB), PCI scan converter card (SCB), image opacification and convolver board (MOB), PCI RAID interface board (IRB), and ISA digital laser film printer board (DHC). Trixell 4600 17"X17" digital X-ray sensor, Digital oscilloscopes, Logic analyzers, PCI, DMA, PIXAR I, SGI Indy, Phantom Force Feedback Device, RS-232, INTEL SBC 86/30, SBC 88/40A, HP-IB (IEEE-488), HP-IL, SERVO II, Opto 22, MTI and ADE distance sensing capacitance probes and cards.

EXPERIENCE

Persistent Systems, LLC, New York, New York. 7/13 - Present

Senior Embedded Software Engineer **7/13 - Present**

- Developed code to implement Height Above Ellipsoid/MSL altitude calculations. Balanced resource requirements against accuracy.
- Developed and integrated configuration and status code for FLIR Recon III IR ranging binoculars.
- Found and fixed multiple bugs in tracker antenna positioning subsystem.
- Modified open source software for iperf, a network performance tool. Increased reliability and robustness.
- Found and fixed long standing segmentation fault in audio daemon.
- Initial user/debugger/enhancer for new, internally developed software for configuration, variable management, and embedded API with over 47,000 lines of multi-threaded, multi-forked C++. Found and fixed multiple bugs and added new features.
- Integrated OpenSL for Android in to audio subsystem code.

SRC Inc., Syracuse, New York 12/04 – 7/13

Multiple *LSTAR*, Zero Conflict, Ground Based Sense & Avoid Prototype System **12/09 – 4/11**

Lead Software Engineer

- This system, when it went live, enabled the **first and only in the nation unattended night flights of an unmanned aircraft system.**
- Responsible for all software for multiple radar and multiple PC air space monitoring system.
- Developed requirements for JAVA/Linux based alerting system.
- Designed, developed in C++, tested, integrated, and documented radar upgrades to support "sense and avoid" mission.
- Coordinated closely with customer on development of system requirements and ongoing development issues.
- Supervised three software engineers.

***LSTAR* Radar Software Baseline Development Lead Software Engineer** **8/08 – 7/13**

- Responsible for all aspects of *LSTAR* radar C++ software development on *LCMR*(V)2 and *LCMR*(V)3 hardware platforms.
- Supervised up to five software engineers.
- Responsible for training team members in software process and monitoring adherence to SRC Inc. ISO software process.
- Designed, developed, tested, integrated, and documented C++ ASTERIX message protocol interface.

Software Group Team Lead **6/07 – 7/13**

- Responsible for performance evaluations, career development, and mentoring of six junior members of software group.
- Three team members are now software leads on their own projects.
- Helped several team members with issues preventing them from developing to their full potential.
- Receive consistently high reviews for leadership and mentoring ability.

SOMISR II LN270 INU Based Motion Compensation Subsystem **2/08 – 7/08**

- Designed, developed in C++, tested, and integrated INU based motion compensation control subsystem for a real time through the wall radar.
- Interfaced with LN270 INU high and low speed serial interfaces, network connection with system control software, and network connection to VHDL SAR subsystem.

TRES (Threat Radar Emitter Simulator) Individual Contributor (5/2005 -6/2006) **5/05 – 3/08**

- Adapted C++ system code and target tracker to function in a missile threat simulator, 360 degree surveillance radar, and shore based ship detection system.
- Coordinated activities of contractor to develop Windows based C++ application to simulate messages from customer system.

Lead Software Engineer (6/2006-3/2008)

- Responsible for all aspects of system software development, documentation, testing, and integration.
- Designed and implemented system configuration so one software/firmware baseline supported three major variants of the TRES radar.
- C++ development, debug, and testing.
- Coordinated design and implementation of multiple system features with customer, SRC Inc. program management, and SRC Inc. digital engineers.
- Worked on and coordinated multi-person effort to increase reliability of system under heavy detection loads.

Lead Software Engineer – Ongoing Occasional Support (3/2008-Present)

- Main point of contact for ongoing support needs. Assist customer in solving system related problems and answer questions as needed to ensure continued customer success.

PAWSS (Persistent Area Warning & Surveillance System) Lead Software Engineer **2/2005 – 11/05**

- Responsible for overseeing design, development, and integration of multiple hardware platform, multiple software system to detect aerosolized chem-bio agents.
- Coordinated activity of contractor working on main software component, MCP, of system.

MTES (Mobile Threat Emitter Simulator) Individual Contributor **12/04 – 1/06**

- Converted C++ alpha/beta mortar tracker to aircraft tracker.

InfiMed, Liverpool, New York **6/96 – 12/04**

Senior Software Engineer – Research and Development Department

Orion Project - PlatinumOne

- Primary embedded C developer for Orion project IAPDB (Image Acquisition, Processing, & Display Board). IAPDB is a single PCI board solution for acquiring, processing, displaying at 30 fps, and transferring 1024X1024 12 bit digital x-ray images to a PC based host computer.
- Worked closely with hardware development team during development of 4 xilinx based PCI devices controlled by INTEL 80303 processor.
- Developed I2O initialization code and I2O message passing code between host PC and IAPDB. Message subsystem consists of C++ code in PC ring 3 application space, ring 0 driver/OS space, and C code running in IXWORKS on IAPDB.
- Designed and implemented C++ W2K driver for IAPDB. Driver implemented I2O interrupt based message passing between host PC code and IAPDB. Driver also managed multiple locked memory image queues.
- Redesigned image queuing and transfer code to support acquiring and storing cardiac images at 60MB/sec. Cardiac images were acquired from CCD camera and stored to an internal RAID at 30 frames per second.
- Designed and implemented multiple image processing and display features; loop acquisition, radiographic spot, programmable sequences, LIH processing, edge enhancement, image window and level adjustment, and many others.
- Supervised 2 embedded developers.

GoldOne Project – Phase I & 2

- Primary WIN95 VxD developer for GoldOne project, one of InfiMed's most successful products.
- Designed and implemented 4 WIN95 VxDs for 4 custom PCI image acquisition, processing and display boards. Code included interrupt handlers, xilinx download code, resource management code, code to manipulate hardware registers, and code to communicate with host software...
- Designed and implemented WIN95 VxD image acquisition and control VxD. This sequencer VxD was the core component of the GoldOne real time image acquisition subsystem.
- Worked closely with hardware team during board development and hardware debug process.

Stingray Project

- Designed and implemented Pixium 4600 x-ray detector interface software.
- Implemented Pixium 4600 calibration and defect correction subsystem.

University of Colorado Health Sciences Center, Dept. of Cellular & Structural Biology

1/92 – 6/96

Denver, Colorado.

Research Assistant - Anatomical Visualization Laboratory

- Edge detection and feature extraction on 2D, 24 bit color anatomical images.
- Designed, built, programmed in C++, and installed control system for proprietary cryogenic macrotome. Project involved interfacing PC-AT to Rolleiflex 6008 and 3003 cameras, Novatron flash unit, stepper motor controlled camera platform, and Servo II controlled milling machine. Project funded by National Library of Medicine **Visible Human Project**.
- Designed and programmed a library for accessing volume data on CRAY, SGI, SUN, and PC platforms.

Illinois Tool Works Inc., Akron Standard Division, Akron, Ohio.

7/87 - 11/91

Research Engineer - Research and Development 10/90 - 11/91

- Performed major upgrade of current standard control software.

Project Engineer - Production Engineering 7/87 - 9/90

- Lead software engineer for the company's main product line. Supervised three programmers.
- Platforms include INTEL 86/30 and 88/40A single board computers that interface to programmable logic controllers, personal computers, and industrial machine controls.
- Wrote motion control code and operator interface for a nine axis, user programmable robotic fixture. Axis positioning done with servo motors, non-contact probe position signals, and proximity switches.

Technical Aid Corp. (EDP/TEMPS), Cleveland, Ohio

6/86 - 5/87

Contract Programmer/Analyst for the Firestone Tire and Rubber Company, Akron, Ohio

EDUCATION

M.S.C.S., College of Engineering and Applied Science, University of Colorado. GPA 3.97 12/93

B.S. in Computer Science, Department of Engineering, Ohio State University. 12/85