Lee C. Baker

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Relevant Achievements

- Created, tested, and deployed Windows-based control software and user interface for a complex tactical RF sensor system, including MySQL data storage back-end, Java operator interface, and multi-threaded real-time data processing module in C.
- Wrote linux-based data mining tools to extract information from the topology and structure of complex networks.
- Implemented a C compiler, including parser, AST generation, optimizer, and x86 code emission.
- Designed, realized and optimized embedded DSP/control application in an proof-of-concept sensing system. Maximized system availability and maintainability by providing a complete set of system self diagnostics. Optimized system performance to exceed customer requirements, leading to success and expansion of initial contract.
- Designed and implemented Windows-based control software and FPGA hardware command interface to directly control functions of concurrently designed RF circuit boards. Successfully designed and implemented a custom serial control protocol over USB enable out-of-band troubleshooting, testing and calibration of RF synthesizer and reciever modules.
- Developed software for a Xilinx microcontroller/FPGA device to communicate simultaneously with 32 aircraft gyroscope modules and interface with a networked desktop computer for testing and calibration purposes.
- Designed and implemented a high speed analog data acquisition system as a PC104 expansion card, including FPGA programming, PCB layout, and Linux driver programming.
- Implemented software for autonomous mobile coordinated robotics system to locate an object within a search area.

Core Technical Skills

Electronics Engineering: Embedded systems, microcontrollers / DSP, circuit design and debug, RF systems
Programming: Data mining, scientific computing, compiler design, algorithm parallelization, performance optimization
Software Engineering: Application development (Mac / Windows / Linux), UI design

Education

Bachelor of Science in Computer Science — New Mexico Tech
Bachelor of Science in Electrical Engineering
Graduated December 2007 with Honors — *Socorro, New Mexico, USA*

Professional Experience

Design Engineer — Invertix Corporation
January 2008 to May, 2011 — *Las Cruces, New Mexico, USA*

- Designed and implemented user-facing software for control of custom hardware elements, integrating user input to increase usability and efficiency of user interfaces
- Designed, developed and integrated embedded control/DSP software
- Debugged and integrated multiple interconnected software and hardware elements to increase uptime, reliability and performance of a complex system
- Received Invertix 2008 Eagle Award for Innovation in recognition of work that contributed to the success of a critical project
- Assist with bench debug of RF synthesizers and receivers

– Evaluated capabilities and technologies before making purchasing and design recommendations for system hardware

Professional Experience (continued)

Embedded Systems Engineering Intern — Applied Technology Associates
May – August 2007 — *Albuquerque, New Mexico, USA*

- Developed calibration and measurement software for embedded applications
- Performed bench integration of custom FPGA/DSP software with custom measurement hardware
- Developed and tested software and hardware for a variety of measurement and sensing applications
- Worked with other engineers to design and implement software to run on concurrently developed hardware

Research Associate — New Mexico Tech Institute for Complex Additive Systems Analysis
May 2006 – January 2007 — *Socorro, New Mexico, USA*

- Performed analysis on complex networks to discover significant relationships and identify key features
- Implemented graph/network analysis tools and metrics
- Developed user interfaces for data mining tools using C/C++, Java, PHP and Perl

Programming Skills

Languages: C/C++, Objective-C, Java, PHP, Python, SQL, various assembly languages
APIs/libraries: STL, SC++L, OpenMP, OpenAL, Win32, JFC
UI design: Win32, Swing/AWT, Cocoa, and National Instruments Labwindows/CVI
Scientific computation/simulation: OpenMP API, MATLAB, Octave, Numpy/Scipy
Web design: HTML, CSS, Javascript, PHP, SQL
Compiler design: scanning, parsing, optimization, instruction selection, and code emission stages
Parallel processing: Win32, OpenMP, and pthreads libraries on Windows and POSIX platforms
Development target OS: Linux, Mac OS X, Windows, embedded

Engineering Skills

Microcontroller/embedded systems: Motorola HCS12, TI TMS320 DSPs in C / C++ / assembly languages
DSP: Digital filtering, signal detection, control algorithms, radar ranging, RF beamsteering using C, C++, and MATLAB on embedded and PC platforms
Lab test equipment: Oscilloscopes, function generators, signal generators, spectrum analyzers, RF network analyzers
FPGA: VHDL design using Xilinx ISE/EDK and Altera Quartus II targetting MAX7000, Spartan 3 and Virtex 4 devices
RF: VHF/UHF transmitter and receiver systems; phased arrays, RADAR, MASINT sensors

Licenses, memberships and awards

Certified Engineer Intern - #6693 — *New Mexico Board of Licensure for Professional Engineers and Surveyors*
Tourism Forecasting Algorithm competition - first place — *Kaggle.com*
Invertix Eagle Award for Innovation (2008) — *Invertix Corporation*
Licensed Paraglider Pilot - P2 rating — *United States Hang Gliding and Paragliding Association*
Scuba Diver - PADI Advanced Open Water — *PADI*
Amateur Radio Operator - Extra Class AE5VD — *US Federal Communications Commision*

References available on request.