

Peter L. Skeggs

Professional Objective

My goal is to utilize my experience in the embedded systems, consumer and hobby robotics, and data storage industries to develop leading edge solutions to difficult problems.

Firmware Work Experience

Principal Embedded Firmware Engineering Manager, EM Microelectronic-US, Inc. 4/2015 – Present

- Managed maintenance and engineering customer support for sensor hub products
- As overall project manager, firmware team manager, and key firmware contributor, successfully led large effort to develop entirely new sensor hub IC for European customer with greatly expanded feature set and performance

Senior Embedded Firmware Engineer, EM Microelectronic-US, Inc., 4/2014-4/2015

- As employee, led firmware and test software teams during successful expansion of sensor hub product line from the original 1 product to 2 new generations for 2 separate major partner companies
- Led firmware design and development to adapt product line to Android sensor hub specifications
- Acted as project manager for releasing IC to production

Contract Firmware Engineer, EM Microelectronic-US, Inc., 10/2013-4/2014

- Put in place firmware development methodologies and procedures to fix ongoing productivity and quality issues in existing sensor hub project (a joint development with another company)
- Worked with existing team to identify, track, and fix existing firmware bugs and add features, leading to design win with major consumer electronics firm
- Designed and built PCB and wrote firmware to interface sensor hub to Windows 8 as a standard Windows 8 sensor subsystem
- Successfully lead technical side of EM's efforts to obtain new sensor hub business with major European company

Senior Software Engineer, Verlitics (aka Emme Energy, aka Home Comfort Zones, Inc.), Portland, OR, 2012

- Greatly extended existing prototype firmware with graphical LCD interface, Adhoc WiFi setup web interface, large Phase Change Memory buffer handling, and internet bootloader
- Readied firmware for preproduction release
- Debugged Microchip's WiFi / Ethernet /TCP/IP stack to enable uninterrupted data flows (60 x four channels of voltage, current, and power measurements per second) to Amazon Web Server for weeks at a time

Partner and Hardware/Firmware Developer (IoT), BlueRail Trains, LLC., 10/2012 – Present

- Designed, developed, and assembled multiple generations of prototype Bluetooth Low Energy motor controllers for model trains (electronics design, schematic capture, board layout, board assembly, antenna tuning, firmware)
- Coordinated emissions testing of products at testing lab

- Successfully worked with Chinese factory of licensing company to adapt board design and firmware for production; commercial product sales started in late 2015

Chief Engineer, [Noetic Design, Inc.](#), Portland, OR, 1993-present (highlights)

- **Firmware Stack for Sensing Research (IoT)**
 - Implemented high performance Bluetooth Low Energy data streaming firmware
 - Created USB, Micro SD card drivers; FreeRTOS, ARM Cortex M3 Processor firmware
 - Wrote sensor drivers for many sensor types (barometer, compass, accel/gyro, ambient light, GPS, audio; interfaced sensor calibration and fusion libraries)
 - Developed Windows 7/8 Sensor Drivers
 - *Intel Labs, (Hillsboro, OR, 10/2012 – 10/2013)*
- **BikeTrak Prototype (IoT)**
 - Wrote all TI MSP430 firmware for bicycle security device
 - Firmware utilized Telit 2g cellular data module, Wi2Wi GPS module, USB power charging protocol, and Freescale accelerometer, to covertly monitor physical state of bicycle and report motion to web server (for display by separate mobile phone app and/or SMS text message or email), while conserving and extending battery life for long periods between charges
 - *BikeTrak (Portland, OR, 2011-2012)*
- **RFID Tag Sorting Machines**
 - Designed and built electromechanical machine for handling RFID tags
 - Wrote all firmware for machine that isolated each tag; wrote unique ICAR ID; stored tags in barcoded bags in a 10 position carousel; sent ID and barcode to backend DB
 - Technologies used include an Arduino Mega controller with Ethernet and Motor/Servo shields; Half Duplex and Full Duplex low frequency RFID writers and readers; optical tag passage sensors which used firmware-based auto-calibration; I2C interface LCD display; I2C interface encoder
 - *OregonRFID (Portland, OR, 2010-2012)*
- **Electronic Toy Prototype**
 - Was responsible for component selection, schematic capture, board layout, firmware development, as well as interfacing with sound engineer and industrial designer
 - *Pulse Global (Santa Ana, CA, 2009-2010)*
- **Ugobe Pleo**
 - Designed electronics (power, servo control, audio playback, SD card, microcontroller, memory) and wrote all firmware for Atmel ATMEGA128-based prototype of Pleo ("Draco") for DEMO06: done in 3 weeks from start to finish; Pleo won DemoGod
 - Ported/expanded firmware for Atmel AT91SAM7S256 ARM processor) for rev 2 Pleo prototype inside of limited physical envelope
 - As member of small team, ported prototype firmware to production Pleo electronics
 - With team, developed sensor processing firmware for NXP LPC2103 ARM processor
 - Managed low level production test firmware development with off shore contractor
 - Specified and managed third party development of PID motion control firmware
 - Developed compressed motion control processing tools and playback firmware
 - Developed audio compression and processing tools and playback firmware
 - Developed a number of sensor algorithms, including sound direction and loudness determination, joint angle / velocity / acceleration, battery temperature / current / voltage / capacity, IR proximity detection, IR communications
 - Solved many complex issues involving hardware/firmware interaction
 - Helped trouble shoot offshore production issues
 - Designed and implemented factory calibration firmware
 - *Ugobe Inc., (Eagle, ID, 2006-2009)*
- **Nubotics Product Development**
 - Designed electronics, firmware, software, mechanicals, optics, test fixtures, codewheels, and assembly fixtures and processes for:
 - WW-01/WW-02/WW-11/WW-12 WheelWatcher Encoders

- WC-132 Differential Drive Controller (including Visual C++ Setup Wizard)
 - ME-110/ME-210 Unicoder Universal Rotary Encoder
 - Wrote user manuals and example programs and provided direct technical support
 - *Noetic Design, Inc. (2004-)*
- **JSP Web Application for eValab Demo**
 - Designed and implemented ARM7TDMI-based firmware for image processing demo
 - Wrote VC++ client application for image capture and transfer to RAVE server
 - Interfaced ARM7TDMI demo firmware with JSP-based eValab server
 - *Simutech, LLC (Portland, OR, 2000-2001)*
- **"RAVE Prototyper" Hardware/Software Integration**
 - Wrote FPGA pinout, PCB board netlist, and JTAG pin data analysis, merging, and interactive query software in Java for use in debugging RAVE hardware
 - Played significant role in integration, testing, and debugging of the RAVE Prototyper's complex hardware and software
 - *Simutech, LLC (Portland, OR, 1998-2000)*
- **DDS-2 SCSI Tape Drive Firmware**
 - Designed and implemented DDS-2 (DAT) tape drive firmware, starting from the DDS-1 codebase I wrote for Iomega and Aiwa
 - Designed changes to DDS-1 drive's architecture to support DDS-2
 - Worked closely with Japanese engineers on drive design and implementation issues
 - *Aiwa Co. Ltd. (Utsunomiya, Japan, 1993-1994)*

Advisory Engineer, Iomega Corporation, IOTAPE Division, San Diego, CA, 1990-93

- Sole developer of SCSI firmware for DDS-1 (DAT) SCSI tape drive, including all test applications (joint development with Aiwa Co. Ltd.)
- Assisted chip selection and design of DDS-1 drive electronics
- Coordinated Design Verification Testing for DDS-1 drive at Iomega headquarters
- Represented Iomega at DDS Standards Committee meetings

SCSI Firmware Engineer, Cipher Data Products, San Diego, CA, 1989-90

- As part of four man team, developed SCSI firmware for QIC-525 tape drive
- Helped design system level architecture and selected major chips for tape drive electronics

Lead Software Developer, ISI / Literal Corp., Colorado Springs, CO, 1985, 1986-89

- Invented WORMTOS, a revolutionary method of simulating erasable files on write once media (written up in PC Week)
- Developed SCSI firmware, test programs, end user utilities, and device drivers for 525 MB, 5¼" optical disk drive
- Completed development of Replicator (optical disk formatter) firmware
- Handled technical customer service calls
- Wrote user manuals for drivers and software

Engineering Intern, Xanar Surgical Laser Systems, Colorado Springs, CO, 1982-1984 (summers)

- Wrote 8085 firmware and built circuitry for advanced Sharp plasma display demonstration prototype of a surgical laser user interface
- Designed test programs and firmware for CO₂ surgical laser systems

Skills

- C++, C; ARC, ARM, 80x86 assembly language
- Extensive embedded systems experience (8051, 68HC11, 8085, 80188, ARM 7, ARM Cortex M3, ARC EM4, AVR, PIC, SiLabs, Arduino, MSP430, some Android)

- Git, Subversion, CVS version tracking systems
- Mantis issue tracking systems
- Familiarity with Jenkins CI, Cmake and make build scripts, FlexeLint static code analysis
- Windows system and application programming
- Experienced with FreeRTOS
- Fading familiarity with eCos, QNX, and AvrX real time OSs
- Familiarity with Python, PHP, Java, Visual Basic
- Tape drive formats and interfaces
- Hardware interfaces such as JTAG, SPI, I²C, SCSI, RS-232, USB, SD Card
- Familiarity with Bluetooth LE and Zigbee wireless interfaces
- Digital design and system level specification experience
- Schematic capture and PCB layout
- PCB assembly (SMT with stencils and reflow oven, etc.)
- Extensive digital electronics debugging and testing experience
- Can operate oscilloscopes, logic analyzers, and emulators

Education

- Japanese Language I and II, University of California at San Diego, 1991-1992
- BSCS and BSEE, Washington University in St. Louis, 1986
- Valedictorian, Cheyenne Mountain High School, Colorado Springs, CO, 1982

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