

MICHAEL P. DEE

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CAREER OBJECTIVE

Seeking a senior level Software Engineering challenge. Preferences: Mission-critical RTOS Control Systems. Embedded Systems. User Interfaces. Hardware Interfaces. Hands-On Lab-Oriented Development.

EXPERIENCE SUMMARY

- Engineering experience covering all phases of the development life cycle in several industries: Irrigation Control, Medical Devices, Commercial Avionics, Defense, Computer, and Telecommunications. Achievement awards in 3 industries.
- Embedded ARM9 firmware, microcode utilities, firmware control and display, data base interfaces, multi-threaded data acquisition and control systems. Embedded medical device using a STM32L with ASIC and CC2430 transceiver. Embedded PC/104 microprocessors controlling rocket thruster test facilities. Embedded Avionics.
- History of Success using tenacity, dedication, and creativity to produce outstanding products despite significant obstacles.
- Willing and able to quickly learn new technology, languages, methods, and skills.
- Constant focus on customers' needs, usage, and perspective to create innovative, efficient, user-friendly products.
- Excellent communication skills. Presented project capabilities at a rocket test group conference at NASA KSC.

SECURITY CLEARANCE:

DoD Secret Clearance expired in 2014. SSBI on File.

EDUCATION:

Bachelor of Science Computer Science and Engineering; California State University Long Beach – 1988

PROFESSIONAL EXPERIENCE:

California Sensor Corporation (Calsense) – Carlsbad, CA Senior Software Engineer – February 2015 - September 2015

Developed embedded C code for the CS3000 Irrigation Controller; the industry leading advanced resource management system. Up to 12 ARM9 based controllers in a chain can monitor and control hundreds of stations as well as other devices. I was responsible for creating GUIs and supporting software to program a variety of communication devices directly from the CS3000. To provide field programming capability, the controller was required to access each device CLI interface through a serial interface and emulate user navigation and command keys. The FreeWave FGR2900MHz serial radio provided long range communication between controllers in a chain using master, repeater, and slave topology. The Lantronix PremierWave XC gateway connected the master controller to the internet via cellular service. The Lantronix PremierWave XN connected via wifi. The Lantronix UDS1100 –IAP connected via Ethernet.

Calsense systems are used to control non-irrigation devices such as ball field lighting, park facility door locks, and fountains. I delivered a complete set of “lights” screens modeled after the look, feel, and underlying structure of irrigation code. Users can set a 14 day rotating schedule with multiple On and Off times each day, manually operate lights, view live usage, view daily usage, and access functionality via the web (I provided database hooks; not the web code). Commands and data were synced between master and slave controllers using tokens and token responses. Real-time data was stored in flash files, battery backed memory, or SDRAM based on read/write frequency and importance.

Development Environment: NXP LPC3250 processor, FreeRTOS, SlickEdit, Rowley CrossWorks with ARM9 JTAG interface, Perforce SCM, FogBugz bug tracker, and PuTTY serial console.

Optivus Proton Therapy – San Bernardino, CA Senior Software Engineer – March 2014 - August 2014

Project responsibilities: New development on the Active Beam Scanning project. This is a significant upgrade to the existing proton treatment facility at Loma Linda University Medical Center. My responsibilities included GUI test development, incorporating user authentication and checksum functionality into a GUI, implementing a CAN bus class to handle CAN communication protocols for the UDP-based EtherCAN adapter, and a hardware abstraction class to handle control of a ISEG EHQ high voltage power supply. All code was in C++ with QT UI framework for the GUIs. All development was performed under FDA approved instructions and procedures.

Development tools included Eclipse, repo/git/gerrit, Visual Paradigm, Squish, and PDM Documentation Management.

Medtronics Diabetes – Northridge, CA

Senior Software Engineer – October 2013 – March 2014

Worked in the Sensor R&D group on embedded glucose sensor firmware.

Project responsibilities: Wrote C code for very low power wireless embedded devices used by diabetic patients. Sensors combine STM32 ARM processors, a proprietary ASIC, and wireless communication. Created a firmware utility that provides configurable sensor scheduling and parameters for clinical field trials. Sensors bias multiple electrodes with DC as well as AC voltages. Measurements across reference and working electrode are used to calculate glucose levels. Various frequencies are used for electrochemical impedance spectrometry. Scheduled measurement are transmitted to external monitoring devices as well as saved to internal EEPROM. Extended studies require judicious use of battery power. Development tools included uVision, Tera Term, Surround, proprietary upload utilities and boot loaders. A custom scheduler is used on the STM32 in place of an OS. Interaction with Medtronic M.D. field trial personnel and electrical engineers was frequent. All code and documentation conformed to 21 CFR 820 and ISO 13485 standards.

Second assignment involved replacing the Bluetooth device with a TI CC2430 transceiver for a prototype sensor. A python based test platform communicating via UART interfaces from a Windows PC was part of the conversion.

Rockwell Collins – Cedar Rapids, IA

Senior Software Engineer – Full-Time: February 2013 – October 2013

Part-Time: October 2013 – January 2014

Project responsibilities: Redesigning EXIP (an open-source Embeddable EXI Processor) to perform EXI-to-XML decoding as a linkable library. Efficient XML Interchange (EXI) is a highly-compact binary encoding of XML data. EXIP Library clients include the electronic checklist and flight deck alert/display systems. The target is embedded avionics systems conforming to DO-178B requirements. The source was not initially designed for flight purposes. Extensive rework has been necessary particularly in memory management and fault handling.

Secondary responsibilities: Writing requirements & documentation, product analysis & testing, team product rearchitecture, automated testing script peer reviews, and development environment issues.

Primary Development: Embedded C, MS Visual Studio, MS Office, ClearQuest, DOORS, DO-178B level B, EXI, EXIPProcessor, XML, UltraEdit, Understand, Beyond Compare, Bullseye Coverage, TortoiseSVN, AGS, Eclipse, Lotus Notes, PREP, ARINC 661.

Northrop Grumman – San Clemente, CA & Edwards AFB, CA

Senior Staff Software Engineer – 2004 to 2012

While engaged at the Northrop Aerospace Test Site – As a Senior Staff Software Engineer from 03/10 to 08/12:

- Successfully supported software development during validation of flight thrusters for spacecraft at the Northrop Aerospace Test Site (NATS) at the Air Force Research Laboratory (AFRL) on Edwards Air Force Base.
- Served as the sole Software Engineer responsible for the development of Data Acquisition and Control (DA&C) systems at NATS. This was a one-man, complete software lifecycle task at a \$6M facility. Responsible for design, documentation, software & firmware development, unit testing, integration testing, delivery, information assurance, configuration management and real-time system support during DA&C operations, data archiving, and long-term system securing.
- Successfully designed, fabricated, installed and tested several hardware facility support systems (site guard arm and semaphore system, fire deluge system, and gas detection system). 24 VDC relays, 4-20 mA loops, and custom rack mounted control panels were used to interface with existing AFRL infrastructure and COTS hardware.
- Created Linux C code weather monitoring and data archiving system. Extremely hazardous chemistry and pressures made weather a critical factor in site operations. Wind direction, speed, and temperature data had to be gathered from multiple remote sensors over Ethernet, displayed in real-time, and recorded for liability purposes. Linux drivers were written to communicate with the remote units. A central database tracked 60-second snapshots, 15-minute averages, and Boolean operational flags indicating if wind direction was within the allowed arcs and speed boundaries.

While engaged at the Capistrano Test Site – ENGR E/S STF as a Senior Staff Software Engineer from 2004 to 2010:

- Functioned as the Lead Software Engineer at Capistrano Test Site (CTS) responsible for the design, development, and delivery of all DA&C systems used to test and validate rocket thrusters and military-grade chemical lasers. Assumed duties with minimal documentation and no software staff. The mission-critical systems must protect life, environment, and valuable NGC property from the extreme temperature, pressure, and chemical hazards associated with CTS test facilities. Replaced 2 retired engineers.
- Developed a world-class PC-based DA&C system that monitors and controls over 500 AI, DI, DO, and DAC channels in real-time at 125 and 1250Hz rates. Keyboards and touch screens provide user input, while 12 monitors provide real-time displays of converted engineering unit values, plots, and graphic elements. Some of the thrusters successfully tested on this system will be aboard the James Web Space Telescope.

- PC/104 units running multi-threaded embedded Linux applications interface to test stand facilities (amplifiers, analog filters, relays, valve drivers, thermocouples, and transducers). PC/104s are linked via Ethernet (TCP/IP V4) to a central dual-CPU Linux server running dozens of multi-threaded processes. Multiple Ethernet ports on the server connect to the display clients. The server uses a combination of shared memory, messaging queues, and semaphores to coordinate simultaneous tasks: PC/104 connection, incoming raw data, engineering unit conversion, calculations, data logging, user input, console output, command logging, timeline processing, display connection, display updates, report generation, configuration database handler, configuration dictionary, software watchdog, hardware watchdog handler, third-party I/O hardware handlers, audio handler, hardware safety panel handler, data archiving, configuration validation, configuration archiving, and system health monitoring.
- Real-time (100Hz) calculations used pressures, temperatures, flow meter frequencies, strain gauge currents, and Boolean position sensors as inputs for degree five polynomial, table lookup w/interpolation, and slope-intercept functions.
- Worked to meet project goals, including: use of low-cost COTS PC hardware, provide all features of CTS legacy systems, minimize user re-training, and allow individual component replacement with evolving COTS hardware in the future. These goals were met along with greatly enhanced system capabilities in size, speed, number of displays, and system health metrics. User interfaces were streamlined, eliminating repetitive tasks.
- Created voice response WAV files for DA&C user feedback using AT&T Natural Voices in Windows XP. Wrote code to open and read these files in Linux, parse the header, connect to Advanced Linux Sound Architecture Sound (ALSA) hardware, and play sounds in real-time as necessary. 44.1kHz, 16 bit codec was used.
- NGC Intellectual Asset Management granted publications rights in lieu of pursuing a patent (DA&C is not NGC core business). Gave a presentation on the system at the Rocket Test Facility Operators Working Group Conference in 04/2008 at the Kennedy Space Center, Life Science Lab in Cape Canaveral, FL.
- Developed a site Disaster Recovery plan. Evaluated, purchased, and programmed a LabView system.

Primary Tools: Linux C, Embedded C, Multi-Threaded, Multi-CPU, Multi-System, Fiber & Copper Ethernet, TCP/IP, RHEL Linux 2.4/2.6, Minux, Multiple Real-Time Displays, PC/104, User Interfaces, Touch Screens, XWindows, ALSA Sound, Bash, ADC, DAC, Hardware Interfacing, EU Conversion Algorithms, Table Lookups, Timeline Processing, Data Capture, Log File Generation, Fault Handling, Fast Prototyping, Configuration Management, Information Assurance, Adobe Photoshop.

Secondary Tools: Paradox, C++, Ethernet Drivers, HTML, LabVIEW, Tru64 UNIX, Meld, Gedit, VI, Linux gcc, Razor, Occam, Audacity, AT&T Natural Voices, Etherial, FacetWin, Sed, Awk, Yacc, Samba, TeamViewer, Schematic Design/Creation, Oscilloscopes, Digital Multi-meters, Fiber-Optic Analysis Tools.

Hewlett-Packard – Cupertino, CA

Software Developer – Employee 1988 to 2003

- Lead software engineer responsible for SQL database Backup and Restore products.
- Led contractors to enhance B/R SQL/MP file size handling from 32 to 64 bits.
- Resolved high-profile field issues as a software representative on the high-end system task force.
- Ported SQL/MX utilities from PC platform to Tandem NSK platform. (OOD, C++, Team of 140 engineers)
- Diagnostic Subsystems Contributor: Designed and implemented I/O controller windows for a UNIX based Motif style GUI used internally. Product was the interface for SCSI disk controller developers to download embedded code and perform integrated testing and debugging from anywhere on campus.

Primary Tools: C, C++, TAL, SQL/MX, NSK, OSS, ClearCase, Windows 95/98/ME/NT, UNIX, Sun Sparc, Bourne/Korn Shells, MKS Toolkit, Awk, Sed, VCS, VC2, TCL, Expect, EMACS, VI.

General Telephone Company (now Verizon)– Santa Monica, CA – Concurrent with CSULB

- Progressed from Electronic Switchroom Equipment Maintainer to Training Specialist teaching 580 hours of course work.

ADDITIONAL EDUCATION:

- Significant additional college units in Architecture, Art, Automotive Mechanics, Construction Technology, Welding, Photography, Chemistry, Electrical Engineering, and Mechanical Engineering.
- Familiar with piloting and navigation of single-engine Cessna and Piper aircraft.
- Completed OOD courses using Java, Java 2 SDK, NetBeans IDE.

OTHER INTERESTS:

Family, Home Improvement, Photography, Auto mechanics.

Additional work experience, project details, and project photos are available: <http://www.MichaelPDee.com>.