Résumé: **Mike Nelson**

Objective: software engineering for embedded systems with real-time performance

Experience: 32 years as a consulting software engineer, 6 years in military electronics

Skills: object-oriented test-driven design, hardware and software integration for real-time systems, extensive background in digital and analog hardware design, team leadership, project management, documentation

Applications: real-time embedded systems, digital signal processing, process control, motion control, hardware/software co-simulation environments, design verification and diagnostic software.

Languages: C / C++ and assembly languages for ARM, TI Floating Point DSPs, TI MSP430 microcontrollers

RTOS: Microsoft Azure ThreadX, Micrium µC/OS-III, Wind River VxWorks

Environments: TI Code Composer Studio**,** IAR Embedded Workbench, IAR visualSTATE, Wind River Workbench, Linux/GNU

Recent Projects:

Inductive Water Meter Reader, (Client name withheld by request), **February 2018 to August 2018:** Developed device control state machine and signal processing algorithms for portable magnetic inductive water meter reader in C for TI MSP430 SoC.

IoT Software Development Platform with ThreadX RTOS, Renesas, April 2015 to December 2015: Debugged and maintained drivers for digital-to-analog converter, timers, and data transfer controllers with full regression test harness and traceability. Wrote user documentation. Recommended a "wiki" for documenting process and product, and effective collaboration.

Vehicle-to-Grid Inverter, Clean Wave Technologies, July 2014 to January 2015: Ported C# inverter simulation running on Windows to C firmware on TI DSP for inverter hardware. Assisted in Underwriters Laboratories testing for inverter. Upgraded analog-to-digital converter driver to product quality code with full regression test harness.

Vehicle Guidance System Power Management, Trimble Navigation, November 2012 to March 2013: Verified design of system modules through several hardware revisions. Added custom Power-over-Ethernet features to system modules firmware. Explored Renesas SoC ultra-low power operation interaction with RTOS.

Magnetic Sensor Development, Valon Technologies, December 2012 to March 2013: Developed firmware for TI MSP430 SoC, which controlled and read magnetic sensors for compass and tachometer applications. Project included real-time processing of waveforms from DC to 3 kHz, low-power portable operation, and “bit-bang” control of an LCD.

Smart Grid Networked Instrument, Sentient Energy, March 2010 to January 2011: ARM7 SoC firmware for instrumentation of high-voltage distribution lines. Digitized 60 Hz line signal and processed it for instantaneous and RMS current, and detecting waveshape faults, drop-outs, sags, surges, and high-current faults. Monitored conductor temperature and managed magnetic harvesting power supply and battery back-up. Commands and data transferred over Smart Meter mesh network radio.

Medical Device Firmware, Proteus Biomedical, December 2008 to March 2009: TI MSP430 SoC firmware for boot loader, software update, flash file system, and event logger. The MSP430 was battery operated, and responsible for power management and communication with a TI TMS320 DSP and an ARM7-based Bluetooth wireless networking module.

Medical Device Failure Analysis, ITI Global, September 2008 to December 2008: Analyze hardware and software for a client's medical device, which was monitored and controlled by two Freescale MC68HC11 microcontrollers. One operated the electromechanical functions of the device and the other ran the user interface. The failure involved the inability of the two controllers' software and hardware to detect that the other controller ceased to operate. Submitted numerous recommendations for changes to hardware and software.

Photovoltaic Panel Microinverter, Tigo Energy, April 2007 to September 2008: Programmed ARM7 SoC to convert DC power from photovoltaic panel to synthesized 60 Hz AC using high-frequency pulse width modulators (PWMs) with closed-loop control for input maximum power point tracking (MPPT), and output phase tracking.

Robotic Wafer Handler Systems Engineering, KLA-Tencor, March 2004 to June 2004 and January 2002 to October 2002: Consulted on architecture of next generation of robotic wafer handlers; evaluated nascent technologies. Integrated off-the-shelf components from various manufacturers to improve reliability, throughput, cleanliness, and cost-effectiveness of wafer handlers. Resolved problems with electromagnetic interference, robot motion repeatability, processing of sensor inputs, and power distribution.

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Other Projects:

Project Description	Organization	Term
Field Engineering	IAR Systems	Mar.'05 to Apr.'07
Design Verification	Airespace (now Cisco Systems)	Jul.'04 to Nov.'05
Distributed Power Supply Control	Extreme Networks	Jul.'03 to Apr.'04
VPN Router Design Verification	Cisco Systems	Mar.'00 to Dec.'00
Satellite Modem Design Verification	ComTier	Aug.'97 to Apr.'99
Token Ring Network Adapter Diagnostics	3Com	Mar.'97 to Feb.'98
Cable Modem Design Verification	Com21	Feb.'96 to Jul.'96
Ethernet-ServerNet Bridge Design Verification	Tandem Computers (now HP NonStop)	Jan.'95 to Dec.'95
Embedded SNMP Agent	Verilink	Jul.'94 to Jan.'95
Video/Audio Compressor, Multiplexer, Encryption	Compression Labs (for DirecTV)	Jun.'92 to Dec.'93
Wide Area Network Management	StrataCom (now Cisco Systems)	Mar.'92 to May'92
Molecular Beam Epitaxy Process Controller	Intevac	Jun.'90 to Nov.'91
Point of Sale Keyboard, Card Reader, and Display	ICL (now Fujitsu Transaction Solutions)	Nov.'89 to Jul.'90
Magneto-Optical Read/Write Head and Media Tester	ProQuip	Sep.'89 to Oct.'89
Human Factors and Advanced Mobility Test Bed	FMC (now United Defense)	Feb.'89 to Aug.'89
Process Controller and Automated Wafer Handler	General Signal ThinFilm	Jun.'88 to Feb.'89
Control System Diagnostics and Data Logging	Bay Area Rapid Transit	Oct.'87 to Jun.'88
IBM PC System Security and Encryption Adapter	CipherTec	Jun.'86 to Sep.'87
Telecommunications Network Automated Test System	Lear-Siegler	Oct.'86 to Jun.'87
Flat-Bed Scanner for Image Processing and OCR	Datacopy Corporation (now Ricoh)	Feb.'86 to Aug.'86
Power Line Disturbance Monitor	Dranetz-BMI	Nov.'84 to Feb.'86
Automated Integrated Circuit Packaging System	Deltron, Philippines	Feb.'83 to Sep.'84

Education:

Subject	School	Term
C++ for Object Oriented Programming	University of California Extension	Feb.'94 to Aug.'96
Structured Software Engineering	Santa Clara University	Sep.'80 to Jun.'81
Digital and Analog Circuit Analysis and Design	Santa Clara University	Jul.'79 to Jun.'80
Microprocessor-based Systems Architecture	Santa Clara University	Jul.'78 to Jun.'79
Analog and Digital Electronics	U.S.Navy Technical Schools	Sep.'72 to Nov.'77