

Résumé: [Mike Nelson](#), [The Real-Time Embedded Systems Specialist](#)

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

Experience: 25 years as a consulting software engineer, 30 years in industry as hardware and 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, hardware/software co-simulation environments, design verification and diagnostic software, process control, motion control, robotics, signal processing, image processing, data compression, encryption, network protocols.

Languages: C, C++, [ARM](#), [Freescale](#), [TI MSP430](#), [Intel](#) Assembly Languages

RTOS: [Micrium](#) μ C/OS-III, [Express Logic](#) ThreadX, [Wind River](#) VxWorks

Environments: IAR [Embedded Workbench](#), IAR [visualSTATE](#), Wind River [Workbench](#), Linux/[GNU](#)

Recent Projects:

Smart Grid Networked Instrument, [Sentient Energy](#), March 2010 to January 2011: [ARM7](#) SoC firmware for instrumentation of high-voltage distribution lines, measuring instantaneous and RMS current, detecting high-current faults, and monitoring conductor temperature. Managed magnetic harvesting and battery back-up. Commands and data transferred over Smart Meter mesh network radio. Selected [ARM9](#) SoC for Linux-based version. Brought up Linux on ARM9 development kit. Modified [Das U-Boot Linux bootloader](#) for proprietary hardware.

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 and raise alarm when the other controller ceased to operate. The result of the failure analysis were 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.

Field Engineering, [IAR Systems](#), March 2005 to April 2007: Created example projects for embedded systems hardware kits and software development tools for [ARM](#) SoCs including [UML](#) state machine design. Conducted day-long seminars in numerous cities in US and Canada. Advised customers on effective use of compilers, debuggers, and high-level design and software verification tools.

Design Verification, Airtespace (now [Cisco Systems](#)), July 2004 to November 2004: Using LabView and networked instruments, created a test bench to verify design of Wi-Fi access point hardware based on [Atheros](#) ASIC. Manufacturing diagnostic software supplied by Atheros was extensively reworked to provide functionality for automated test.

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. Incorporated [SEMI-standard](#) eDiagnostic features in hardware and software. Resolved problems with electromagnetic interference, robot motion repeatability, processing of sensor inputs, and power distribution.

Résumé: **Mike Nelson, [The Real-Time Embedded Systems Specialist](#)**

Distributed Power Supply Control, [Extreme Networks](#), July 2003 to April 2004: [MSP430](#) firmware for control and management of distributed power supplies for a fault-tolerant server application. Management software runs under Linux and communicates with multiple power supply controllers via I²C interfaces.

VPN Router Design Verification, [Cisco Systems](#), March 2000 to December 2000: Wrote system level diagnostics in a hardware and software co-simulation environment for a VPN Router. Model included two closely-coupled Motorola PowerPC processors with shared cache, 128-bit wide shared memory interface with DMA, attached encryption accelerators and network interfaces. Tests included cache coherency, virtual memory management, and dynamically prioritized bus arbitration between PowerPC processors and DMA and other peripheral bus masters.

Other Projects:

Project Description

Optical Multiplexer Manufacturing Diagnostics
Optical Networking Line Interface Diagnostics
Communications Protocol Design and Development
Diagnostic Software Development Tools
Satellite Modem Design Verification
Token Ring Network Adapter Diagnostics
Cable Modem Design Verification
Ethernet-ServerNet Bridge Design Verification
Embedded SNMP Agent
Project Management
Video/Audio Compressor, Multiplexer, Encryption
Wide Area Network Management
Molecular Beam Epitaxy Process Controller
Point of Sale Keyboard, Card Reader, and Display
Magneto-Optical Read/Write Head and Media Tester
Human Factors and Advanced Mobility Test Bed
Process Controller and Automated Wafer Handler
Control System Diagnostics and Data Logging
IBM PC System Security and Encryption Adapter
Telecommunications Network Automated Test System
Flat-Bed Scanner for Image Processing and OCR
Power Line Disturbance Monitor
Office Automation, LAN, WAN, Distributed Database
Automated Integrated Circuit Packaging System

Organization

Centerpoint Broadband Technologies
[Cosine Communications](#)
[WebTV](#) (now MSN TV)
[DiagTools](#)
ComTier
[3Com](#)
Com21
Tandem Computers (now [HP NonStop](#))
[Verilink](#)
Octel (now [Avaya](#))
Compression Labs (for [DirecTV](#))
StrataCom (now [Cisco Systems](#))
[Intevac](#)
ICL (now [Fujitsu Transaction Solutions](#))
ProQuip
FMC (now [United Defense](#))
General Signal ThinFilm
[Bay Area Rapid Transit](#)
CipherTec
Lear-Siegler
Datacopy Corporation (now [Ricoh](#))
[Dranetz-BMI](#)
[Seamen's Union](#), Philippines
Deltron, Philippines

Term

Dec.'00 to Oct.'01
Nov.'99 to Mar.'00
Nov.'98 to Jun.'99
Oct.'98 to Oct.'99
Aug.'97 to Apr.'98
Mar.'97 to Feb.'98
Feb.'96 to Jul.'96
Jan.'95 to Dec.'95
Jul.'94 to Jan.'95
Jan.'94 to Jul.'94
Jun.'92 to Dec.'93
Mar.'92 to May'92
Jun.'90 to Nov.'91
Nov.'89 to Jul.'90
Sep.'89 to Oct.'89
Feb.'89 to Aug.'89
Jun.'88 to Feb.'89
Oct.'87 to Jun.'88
Jun.'86 to Sep.'87
Oct.'86 to Jun.'87
Feb.'86 to Aug.'86
Nov.'84 to Feb.'86
Jan.'83 to Sep.'84
Feb.'83 to Sep.'84

Education:

Subject

C++ for Object Oriented Programming
Structured Software Engineering
Digital and Analog Circuit Analysis and Design
Microprocessor-based Systems Architecture
Analog and Digital Electronics

School

[University of California Extension](#)
[Santa Clara University](#)
[Santa Clara University](#)
[Santa Clara University](#)
[U.S.Navy Technical Schools](#)

Term

Feb.'94 to Aug.'96
Sep.'80 to Jun.'81
Jul.'79 to Jun.'80
Jul.'78 to Jun.'79
Sep.'72 to Nov.'77