Jody Ono

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Professional Experience

DMF Lighting — December 2022 to Present
PRINCIPAL FIRMWARE ENGINEER — Carson, CA

- Involved in all aspects of embedded lighting control
- Embedded H/W & F/W design with:
  - STM32 (STM32CubeIDE)
  - NXP LPC824, LPC845 (MCUXpresso)
  - Renesas RA6M2 (e² Studio)
  - Altium Designer
- DALI & DMX512 firmware development in C
- Win32/64 application development in C++
- Android mobile application support
- NFC/RFID integration & app development
- Bare-metal & FreeRTOS implementations
- SVN source code control
- MantisBT bug tracking
- H/W & F/W debug using ST-Link, NXP MCU-Link, Segger J-Link, scopes, logic analyzers and PCB rework when necessary
- Supervision of remote firmware development teams

FrontRow Calypso LLC — April 2015 to November 2022
PRINCIPAL SOFTWARE ENGINEER — PETALUMA, CA

- Designed and developed networked classroom A/V communication platforms based on ARM Cortex:
  - STM32
  - i.MX6
  - PSoC 4/5/6
  - ATSAM
  - OMAPL137
  - TMS320C6000 DSP (with and without DSP/BIOS)
  - dsPIC33
  - MSP430
  - STM8
- Bare-metal
- RTOS
- Embedded Linux
- HW/FW design included:
  - Firmware update
  - IR and DECT communication (SC14441)
  - Audio streaming
  - Ethernet/Wi-Fi
  - Embedded web servers
  - I²C
  - SPI
  - I²S
  - USB
  - RS-232
  - Bluetooth (CSR8635)

- BLE/Thread (nRF52840)
- Developed enhancements and bug fixes for Windows control application in Delphi XE7
- All firmware development in C/C++ using:
  - STM32CubeIDE
  - STM32CubeMX
  - Cypress PSoC Creator
  - IAR Embedded Workbench
  - TI Code Composer Studio
  - Microchip MPLAB
  - gcc or other cross-compilers
  - Code debug with JTAG/SWD using:
    - ST-Link
    - J-Link
    - Spectrum Digital XDS
    - PICkit
    - Other in-circuit debuggers
- Windows test applications written in C++ using Embarcadero RAD Studio Berlin, Tokyo, and Sydney
- Build utilities written in C/C++, C#, PowerShell
- Test fixture code written in C/C++ for Arduino targets and C# (VS2017) for Windows 10 targets
- Source code control via SVN, Git
- Hardware skills include:
  - Schematic capture
  - Board bring-up and debug
  - Fine-pitch board repair and modification
- Test tools include:
  - Scopes
  - Logic analyzers
  - WireShark
  - Microscopes
  - Full solder rework, including hot-air
  - Toaster-oven reflow

Aldetec, Inc. October 2014 to Present
FIRMWARE CONSULTANT SACRAMENTO, CA

- Developing embedded firmware in C for ARM Cortex-M4 and Atmel AVR-based microwave amplifier control electronics
- Tool chain includes:
  - gcc, Visual Studio Code, SEGGER J-Link
  - CodeVisionAVR C Compiler
  - Atmel JTAGICEmk-II
  - Tortoise SVN
  - Altium Designer
- Involved in hardware & firmware design of space-qualified RF equipment, from schematic capture to client design reviews

Wind Harvest International
January 2022 to May 2022

EMBEDDED SYSTEMS CONSULTANT
DAVIS, CA

- Created updated PLC firmware for latest wind turbine prototype hardware
- Specified, procured, setup remote computing/control platforms
- Deployed and debugged software and firmware remotely

Synapse Product Development
January 2022 to May 2022

FIRMWARE ENGINEER
SEATTLE, WA

- Developed interface and CLI code in C/C++ for Nordic nRF52840 Zigbee dongles on an embedded Linux product platform
- Wrote driver and CLI code in C for Analog Devices AD7147 capacitive touch controllers on an STM32H7-based bare-metal platform

Lorom Cable and System Design
June 2016 to February 2017

CONSULTANT
MORRISVILLE, NC

- Created microcontroller firmware in C for various Microchip MCU-based QSFP cable products

RGB Spectrum, Inc.
May 2016 to November 2016

CONSULTANT
ALAMEDA, CA

- Developed QV2Synergy Windows application to translate QuadView layout information to Synergy screen configuration on-demand
- All code written in C++ using Embarcadero RAD Studio 10.1 Berlin

Owlized, Inc.
August 2014 to December 2015

CONSULTANT
SAN LEANDRO, CA

- Developed embedded firmware in C and C++ for PIC and Arduino platforms with Bluetooth connectivity

Springer Design, Inc.
July 2014 to May 2015

CONSULTANT
DUBLIN, CA

- Developed embedded firmware in C++ for ARM Cortex M4-based patient monitoring device
- Target platform was Freescale Kinetis K70 running MQX 4.x and PEG+ embedded GUI
- Tool chain included CodeWarrior 10.6, P&E Micro Tracelink, Tortoise SVN

Flip Technologies, Inc.
June 2014 to January 2017

CONSULTANT
SAN FRANCISCO, CA

- Developed embedded firmware in C for ARM-based medical imaging products
- Target platform was embedded Linux on AT91S MCU
- Development environment was Ubuntu 14.04 LTS x64
- Modified Atmel SAM-BA tool for custom development hardware
- Modified bootloader and Linux kernel
- Tool chain included gcc, make, git, ARM cross-development tools

FrontRow Calypso LLC. October 2013 to May 2014
CONSULTANT PETALUMA, CA

- Developed embedded firmware in C, assembly language, and JavaScript for networked classroom A/V communication products
- dsPIC33 MCU
- HW/FW design and debug for:
  - Audio codecs
  - HDMI MUX/switches and repeaters
  - HDBaseT converters
  - Analog telephony control
  - Ethernet and embedded web servers
- Tool chain included:
  - MPLAB C30/ASM30
  - MPLAB IDE
  - MPLAB ICD3
  - Tortoise SVN
  - WireShark
  - Scopes
  - Logic analyzers

Bramson Welch & Associates, Inc. September 2011 to March 2014
CONSULTANT EMERYVILLE, CA

- Developed embedded firmware in C (ARM, PIC, µC/OS-II)
- Developed Windows test software in C++ for medical and consumer devices
- Tool chain included:
  - IAR Systems EWARM
  - Segger J-Link
  - MPLAB IDE
  - MPLAB ICD
  - Microsoft Visual Studio
  - Tortoise SVN

Wind Harvest International May 2012 to January 2013
CONSULTANT DAVIS, CA

- Co-designed wind generation control system
- Wrote firmware for Triangle Research FMD88-10 PLC
- Created Win32 application (C++, RAD Studio XE2) and JavaScript for remote monitoring and control

Lakewood Instruments August 2008 to November 2012
CONSULTANT MILWAUKEE, WI

- Embedded firmware development in C for Atmel AVR-based industrial control products
- Tool chain included:
  - ImageCraft ICCV6 C Compiler
  - Atmel AVR Studio
  - Atmel ICE50 emulator
  - Atmel STK500 development system
  - Microsoft Visual SourceSafe

Pix2o Corporation — October 2011 to March 2012
CONSULTANT — ROHNERT PARK, CA

- Developed embedded firmware in C for TI Stellaris ARM
- Developed utilities in C++ (Windows) for large-scale video LED products
- Tool chain included:
  - TI Code Composer Studio 5
  - Embarcadero RAD Studio XE2
  - Tortoise SVN

Atmel Corporation (now Microchip) — September 2011 to October 2011
CONSULTANT — SAN JOSE, CA

- Developed embedded firmware in C (PIC)
- Windows application software
- USB drivers in C++ for LED controller IC's
- Tool chain included:
  - Microchip MPLAB C
  - ICD 2
  - Borland Developer Studio 2006
  - Microsoft Visual SourceSafe

National Semiconductor (now Texas Instruments) — June 2011 to November 2011
CONSULTANT — SANTA CLARA, CA

- Developed Atmel XMEGA embedded firmware in C for low-power mobile devices
- Created Windows test harness application in C++ to exercise Bluetooth OTA and all other functions of target
- Tool chain included:
  - Atmel AVR Studio 4
  - JTAGICE mkII
  - Embarcadero C++ Builder 2010
  - Microsoft Visual SourceSafe

Layered Intelligence Corporation — February 2011 to March 2011
CONSULTANT — MILL VALLEY, CA

- Developed embedded firmware (in C) for ARM Cortex-M4 image processing prototype on Freescale Kinetis K60 tower platform
- Developed message processing for Ethernet communication with target
- Windows test software written in Borland C++ Builder 2010
- Embedded tool chain included:
  - Freescale MQX
  - IAR Systems EWARM development system

mSilica, Inc. (acquired by Atmel) — July 2007 to January 2011
CONSULTANT — SANTA CLARA, CA

- Firmware, driver, and software design for custom integrated circuits
- Developed USB/I²C firmware in C for PIC18F4550, PIC18F2455, and ATmega88 using:
  - MCC18 C compiler
  - MPLAB IDE
  - ICD 2 debugger
  - CodeVision AVR
  - JTAGICE mkII
- Developed Win32 application software and USB driver in C++ for Windows XP & Vista platforms using Borland Developer Studio 2006 and assorted third-party VCL components
- Source code control with Microsoft Visual SourceSafe

Orchard-Rite Ltd, Inc. — October 2009 to November 2009
CONSULTANT — YAKIMA, WA

- Embedded C/C++ firmware development for Atmel AVR32-based RF mesh network products
- Tool chain included:
  - IAR Embedded Workbench
  - Atmel JTAGICE mkII

Schilling Robotics LLC — January 2008 to April 2008
CONSULTANT — DAVIS, CA

- Developed firmware for TMS320DM642-based HD video link for deep-sea Remote Operated Vehicle (ROV)
- Tool chain included:
  - TI Code Composer Studio
  - Spectrum Digital XDS510 USB emulator

Innovative Imaging, Inc. (acquired by Ellex) — April 2005 to November 2007
CONSULTANT — SACRAMENTO, CA

- Lead developer of Win32 software for medical ultrasound imaging product based on Windows XP Embedded platform with kernel agent device driver extensions (DriverX) for real-time control of imaging hardware
- Development environment was Borland C++ Builder 6 Professional with assorted third-party VCL components
- Product features included:
  - Real-time imaging
  - Self-contained database
  - Archive to CD/DVD media
  - Export to various image file formats
  - Internet-based software updating
  - Encrypted license/feature control

Thoratec Corporation (acquired by Abbott) — August 2006 to February 2007
CONSULTANT — PLEASANTON, CA

- Atmel AVR firmware development for various Ventricular Assist (VA) devices and accessories

EMIT Technologies LLC — January 2007 to February 2007
CONSULTANT — SEATTLE, WA

- Atmel ATmega128 firmware designed with CodeVisionAVR
- CPLD design (VHDL) and NIOS II code development using Altera Quartus II for advanced microwave technology products

Schilling Robotics LLC — September 2005 to October 2005
CONSULTANT — DAVIS, CA

- Created firmware for Freescale MC9S12NE64 to control various peripherals via I^2C as part of telemetry system
- Developed bit-banged I^2C drivers and interface code for Small Form-Factor Pluggable (SFP) devices
- All code cross-developed in C using CodeWarrior on Windows platform

Sound Metrics Corp. — March 2005 to April 2005
CONSULTANT — LAKE FOREST, WA

- Provided tool support for serial communication library and Watcom development environment

Innovative Imaging, Inc. (acquired by Ellex)
June 2003 to September 2004
CONSULTANT
SACRAMENTO, CA

- Assisted in object-oriented Win32 software development for medical ultrasound imaging product based on embedded Pentium III-class PC running Windows 2000 or XP Embedded and various real-time extensions (WinRT)
- Development environment was C++ in Visual Studio .NET 2003 and Borland C++ Builder 6 Pro
- Developed DirectX 9 and GDI-based real-time graphics display code for A-mode and B-mode scanning displays

Baldwin Environmental, Inc. (now Perma Pure)
October 2002 to January 2004
CONSULTANT
RENO, NV

- Xilinx CPLD design
- Hardware debug
- Atmel AVR-based firmware development for sample conditioner product
- Features included:
  - Multi-channel data acquisition
  - PWM
  - Calibration
  - PID thermal control
- Onboard resources included:
  - External static RAM
  - Serial (SPI) FLASH
  - 16x2 LCD
  - RS-232
- Design incorporated:
  - Atmel ATmega128 microcontroller
  - Crystal Semiconductor CS8900A Ethernet PHY for embedded browser interface
- Code developed in C using:
  - CodeVision AVR
  - PR_RTX real-time kernel
  - JTAG ICE debugging

NovaLynx Corporation
August 2002 to Jan 2003
CONSULTANT
AUBURN, CA

- Hardware debug and Atmel AVR-based firmware development for wind speed and temperature monitoring
- Product uses Atmel ATmega16 microcontroller with NTC thermistor and included:
  - Hyundai or Seiko 16x2 LCD
  - RS-232 debug
- Code developed in C using CodeVision AVR and PR_RTX real-time kernel

Biomechanical Consultants of California
July 2002 to August 2002
CONSULTANT
DAVIS, CA

- Created LabWindows/CVI real-time data acquisition software for Windows with:
  - Single-shot, triggered waveform acquisition on multiple channels
  - Stream-to-disk capabilities
- Application was targeted for handheld PC running Windows 98

HydroLynx Systems, Inc.
January 2002 to January 2004

CONSULTANT
WEST SACRAMENTO, CA

- Microcontroller firmware development
- Hardware design and debug for remote sensing and RF repeater products based on Microchip Technology PIC MCU's (PIC12C508, PIC16C65B, PIC16x73, PIC16F874)
- Code developed in C using CCS PICC under Windows
- Extensive use of I²C, tone decoding and encoding
- Maintained ToolBox Windows application (Visual C++)
- Created Borland C++ Builder 6 application for scheduled dialup and data retrieval from remote sensing stations

California Primate Research Center
June 2001 to September 2002

CONSULTANT
UNIVERSITY OF CALIFORNIA, DAVIS

- Developed NIH CORTEX code for stimulus presentation and coding with awake behaving primates
- Developed CED Spike2 scripts for data analysis
- Designed and constructed reward delivery control electronics
- Built CORTEX-to-CED digital interface cable and wrote corresponding event code processing scripts
- Miscellaneous computer/electronics problem-solving

Loctronics, Inc.
July 2001 to December 2001

CONSULTANT
RANCHO CORDOVA, CA

- Developed C/assembly language firmware
- Corrected hardware design for embedded RFID automotive security product based on Mitsubishi 37531 microcontroller and Temic/Atmel transponder IC
- Used IAR Embedded Workbench development environment with Mitsubishi PC4701M emulator
- Wrote Win32 application for RFID programming using Borland C++ Builder to interface with third-party ActiveX/OCX object

Indivos Corporation
June 2001 to September 2001

CONSULTANT
OAKLAND, CA

- Assisted in hardware redesign of Hitachi SH7750 CPU board for biometric point-of-sale terminal system
- Ported startup firmware, flash programming code, ThreadX kernel to SH4 target using:
  - Green Hills Software MULTI 2000 C++/C/assembly language development environment
  - Hitachi E10A JTAG ICE under Windows 2000
- Wrote I²C code for communication between SH4 master and PIC18C252 slave. PIC development with CCS PCWH C compiler and EPIC programmer
- Assisted in schematic and CPLD design for embedded USB host controller board based on ScanLogic IC
- Hardware design tools included Protel 99 SE and Xilinx Foundation

Center for Neuroscience
November 2000 to June 2001

CONSULTANT
UNIVERSITY OF CALIFORNIA, DAVIS

- Developed digital audio stimulus presentation software using:
  - Tucker-Davis Technologies hardware
  - ActiveX interface/control components
  - Borland C++ Builder
  - TurboPower Orpheus and SysTools
- System was used with awake, behaving primates

TrueTime, Inc. April 2000 to June 2000
CONSULTANT SANTA ROSA, CA

- Developed Windows diagnostic/demonstration utility application for PCI-bus precision synchronized time code generator using Microsoft Visual C++ 6.0

Giga-tronics, Inc. July 1999 to August 2000
CONSULTANT PLEASANTON, CA

- Developed embedded C/C++ code for IEEE-488 native mode and SCPI commands for a MC68340-based microwave test instrument running Nucleus RTOS
- Target code cross-compiled using Diab Data D-C++ and pre-tested/simulated using Borland C++
- Embedded development tools included:
  - EST visionICE Background Mode Debugger
  - visionClick software
- Wrote Windows C++ application for firmware upgrades via RS-232 using Borland C++ Builder and TurboPower AsyncPro communications library

Center for Neuroscience November 1997 to September 2000
CONSULTANT UNIVERSITY OF CALIFORNIA, DAVIS

- Responsible for design and implementation of trial-based stimulus sequencing and data acquisition software/hardware for use in the research of neuronal mechanisms involved in visual pattern recognition.
- Typical system requirements included:
  - Real-time control better than 1ms
  - Frame-accurate, refresh-aligned video display dynamics
  - Timing accuracy to 1ms
  - TCP and digital communications control
- Development tools included:
  - National Instruments LabWindows/CVI
  - Microsoft Visual C++
  - Borland C++ Builder
  - TurboPower Async Professional
  - DirectX 7
  - Visual SourceSafe
- Developed real-time kernel-level driver for PCI data acquisition card using:
  - NuMega Driver::Agent
  - SoftICE
  - VToolsD
- Developed 64-channel data acquisition software featuring:
  - Real-time display
  - Stream-to-disk
  - Programmable triggering
  - Sync statistics collection
  - Remote TCP control

Folsom Research, Inc. (acquired by Barco) June 1997 to August 1998
CONSULTANT RANCHO CORDOVA, CA

- Assisted development of Windows application in Borland C++ Builder with TurboPower Async Professional library for Radar Remoting & Tracking System (RRTS)
- Product communicates via RS-232 links with multiple radars and video scan converter to track, display, and log maritime vessel movement in real-time on Windows NT 4.0 workstation PC's
- Other features included user-defined zones, lines, reference points, history trails, video remoting, remote control

Advanced Mobile Solutions, Inc.
July 1998 to January 1999
CONSULTANT
MORAGA, CA

- Developed PC-based manufacturing test fixtures with statistical process control for cellular telephone accessories
- Test equipment was controlled via IEEE-488 GPIB using National Instruments LabWindows/CVI
- Other development tools included Borland C++ Builder, SPSS QI Analyst

Duncan Technologies, Inc.
December 1997 to June 1998
CONSULTANT
AUBURN, CA

- Completed development on production version of Flight Absorption System (FAS), including firmware for Motorola MC68360 QUICC and Intel 28F016SV flash memory devices
- Code was developed using the Microtec MCC68K C Compiler and corresponding assembler/linker/librarian in conjunction with EST visionICE for 68K Background Debug Mode (BDM) emulator
- Corresponding Windows applications for control and data conversion were written using National Instruments LabWindows/CVI and Borland C++ Builder
- Developed Windows stereo image viewing software for use with LCD shutter goggles
- Application flips two images at the vertical refresh frequency of the target monitor
- Development tools included Microsoft Visual C++, MFC, Borland C++ Builder, DirectDraw 5

Integrated Surgical Systems
February 1998, April 1998 to May 1998
CONSULTANT
SACRAMENTO, CA

- Debugged SCSI tape driver functions for use in protected-mode DOS with Watcom C/C++ 11.0 and DOS/4GW DPMI extender
- Began development of Windows NT case manager application for surgical planning station using Borland C++ Builder

Expert Microsystems, Inc.
March 1997 to May 1998
CONSULTANT
ORANGEVALE, CA

- Designed embedded firmware/logic for 8051-based Hydrogen Detection System (HDS) on a 6U VME board featuring multi-channel data acquisition and control, PID sensor temperature regulation, RS-232 and VMEbus communication paths
- The RS-232 link includes both packet and text-terminal modes of operation at 19200 bps
- VMEbus communication is achieved using a dual-ported RAM messaging protocol
- All code development for the 8051 was performed in C using the Keil Software Development System
- Used ISP Synario 5.0 to enhance existing Lattice ispLSI-1032 programmable logic design to support on-board EEPROM programming and provide hardware PWM channels

Calimetrics, Inc.
June 1997 to October 1997
CONSULTANT
EMERYVILLE, CA

- Developed Windows application (ComBlaster) using Microsoft Visual C++ & MFC to transmit command files to test equipment via RS-232 port

Duncan Technologies, Inc.
CONSULTANT

September 1996 to September 1997
AUBURN, CA

- Designed and developed firmware for 80C196KC-based laser igniter subsystem in C and assembly language using BSO Tasking development system
- Designed host/slave communications protocol
- Subsystem monitors several temperature and pressure sensors via A/D converter and controls various valves and switches via digital I/O
- Developed software for prototype Flight Absorption System (FAS), a spectral absorption measurement system that samples multiple optical sensors and stores data in nonvolatile memory
- The prototype target uses PC/104 components with software written in Watcom C/C++ 11.0 and utilizes the Greenleaf CommLib 5.2 communications library running under DOS
- An accompanying LabWindows/CVI application module was also developed to control the the FAS via a 57600 bps RS-232 link, providing real-time data monitoring and XModem-1K file transfer. Designed, developed, and debugged the communications protocol
- Created a Windows application (FAS Data Converter) using Borland C++ Builder to convert spectral data files to comma-delimited ASCII text files

MedaSonics, Inc. (acquired by CooperSurgical)
CONSULTANT

March 1995 to March 1997
FREMONT, CA

- Designed microcontroller hardware and software for back-end of Doppler fetal stethoscope device (firstBeat)
- The battery-powered product uses a Microchip Technology PIC16C73 microcontroller to determine/display heart rate and control audio output circuit
- Estimated heart rate is displayed on an LCD that is controlled via I^2C bus
- Firmware development was performed in C and assembly language using the Byte Craft Limited PIC Code Development System
- Developed Doppler sensitivity test fixture software for use with PC-controlled data acquisition/motion control system using Watcom C/C++ with 32-bit DPMI extender and MetaWINDOW graphics library (for event-driven GUI)
- Developed security and compression software for trans-cranial Doppler system based on embedded PC platform
- Modified existing product software written in Zortech C++ for execution under US Software's MultiTask! real-time kernel with DOS extender

Folsom Research, Inc. (acquired by Barco)
CONSULTANT

March 1995 to June 1996
FOLSOM, CA

- Developed firmware for VMEbus 680x0 and 68340-based radar products in C and assembly language with SDS Cross-Development System
- Typical firmware functions include power-up diagnostics, RS-232 user command processing, dual-port RAM-based inter-processor communication, radar vector interrupt processing
- Developed protected-mode PC-based test fixtures for acquiring and displaying radar test data using SBS Bit 3 PCI-VME bus adaptor, Metagraphics MetaWINDOW graphics library, and Watcom C32 with 32-bit DPMI extender
- MetaWindows library used to create event-driven GUI
- Developed Windows-based test software for production board and system tests

EndoSonics Corp.
September 1993 to March 1995
CONSULTANT
RANCHO CORDOVA, CA

- Developed system software and peripheral firmware for intravascular ultrasound imaging systems
- Host systems based on MC680x0 CPU in a 9U VMEbus backplane running OS-9
- Designed bit-mapped icons and logo for graphics display subsystem based on TMS34020
- Developed hardware diagnostics tools for manufacturing and field service
- Designed embedded software upgrade subsystem
- Designed and implemented 80C51 and MC680x0 firmware (C, assembly language) for patient interface module (PIM) that communicates with host and catheter-mounted Dallas DS2502 Add-only serial PROM IC
- Modified 80C51 and 80C550 hardware and firmware (C, assembly language) for enhanced Patient Interface Module Controller (PIC) and User Interface Controller (UIC)
- Implemented software-based log compression and grayscale enhancement tools

Aspect Electronics, Inc.
May 1993 to May 1994
CONSULTANT
AUBURN, CA

- Developed video image acquisition module for capturing, displaying, and storing real-time medical ultrasound images in modified TIFF format
- Designed video signal interface board for IBM PC bus and remote switches (using Tango Schematic)
- Product was comprised of:
    - 80x86 motherboard with 8 MB RAM
    - Commercial 24-bit video frame-grabber board
    - Cine-loop memory card
    - Video signal interface board
    - Ethernet network interface card
    - 3.5" SCSI magneto-optical disk drive
    - 345 MB IDE hard disk
    - Remote keypad and switches
- Assisted in implementation of DICOM protocol for transmission of image data from acquisition module to various Ethernet servers
- Wrote protected-mode-to-real-mode hooks to ASPI (Advanced SCSI Programming Interface) driver
- All software was written in Borland C and Watcom C32 with protected-mode multitasking extensions (US Software MultiTask!) and DOS/4GW 32-bit DOS extender

EndoSonics Corp. (acquired by Volcano Corp & Philips)
December 1992 to February 1993
CONSULTANT
RANCHO CORDOVA, CA

- Developed 8051 assembly language firmware for User Interface Controller (UIC) of ultrasonic scanned-image catheter system
- The UIC receives and routes user inputs from keyboard, function keys, and trackball
- Designed and documented message protocol for communication with 68000 VME Host via dual-port RAM
- Designed and documented message protocol for RS-232 communication with Front End/Patient Interface Module (FE/PIM)

VeriFone, Inc. — June 1990 to June 1992
CONSULTANT — GEMSTONE DIVISION, AUBURN, CA

- Designed hardware (using OrCAD SDT, PLD) and software (all firmware, O/S drivers, test applications, font utilities) for intelligent vacuum fluorescent display (VFD) peripherals based on MC6805 & MC68000 processors for the Gemstone POS product line
- Designed interprocessor communication protocol using Motorola's Serial Peripheral Interface (SPI)
- Designed discrete SPI hardware for use with various host processors
- Developed device drivers in Lattice C and assembly language for MC68302 Serial Communication Controller subsystem
- Developed I/O manager subsystem for Kadak AMX-based realtime operating system
- Created various cross-development utilities in Borland C
- Developed bank-switched ROM/RAM firmware kernel and application programming interface in C and assembly language for MNP3 modem peripheral based on Zilog Z84C15 to support downloadable code modules

Life Measurement Instruments, Inc. — July 1991 to August 1991
CONSULTANT — DAVIS, CA

- Designed 16-bit, IBM PC ISA bus-compatible add-in board (using OrCAD SDT, PLD) for data acquisition and control as part of a body plethysmography system (The Bod Pod)
- The 3/4-length card uses all-CMOS circuitry and features eight channels of 12-bit A/D with selectable feedback loops, eight channels of 16-bit D/A, sixteen channels of digital I/O, and three timer/counters
- Wrote software driver functions in Borland C to control all on-board resources

H.W. Theller, Inc. — November 1990 to May 1991
CONSULTANT — PETALUMA, CA

- Designed and implemented time-division multiplexed software subsystem in Microsoft C and assembly language to control heated dies and allow programmable data acquisition in real-time for IBM PC-controlled heat sealer
- Provided proportional-integral-derivative (PID) temperature control at a set frequency with discretely adjustable load cell sampling rate
- Cleaned-up and enhanced existing graphics display routines

Sunrise Medical Quickie Designs — December 1990 to January 1991
CONSULTANT — FRESNO, CA

- Designed controller board (using Tango Schematic) for intelligent wheelchair motor control system based on 80C51-derivative microcontroller (Signetics 8xC552)
- Constructed, tested, and debugged prototype hardware, developed startup, basic control, and data acquisition firmware (Franklin C, assembly language), and assisted in integration with analog control components

UCDMC Pulmonary Services Laboratory — July 1984 to May 1990
CONSULTANT — SACRAMENTO, CA

- Designed and implemented a comprehensive on-line blood gas laboratory data management system written in Microsoft QuickBASIC 3.0 and assembly language on an enhanced IBM PC running multi-user, multitasking operating system and Novell Btrieve
- Features include data acquisition, diagnostic interpretations, instrumentation quality control, automated billing and archiving, laboratory information system interface
- Provided full set of design documentation for all software modules

Loredan Biomedical, Inc.
August 1987 to August 1989

SOFTWARE ENGINEER
DAVIS, CA

- Developed real-time software in Pascal, C, and assembly language for microprocessor-controlled physical therapy products
- Specific responsibilities included all firmware/software related to data acquisition and control of robotic electromechanical assembly by embedded, single-board STD-BUS x86 computer communicating with IBM PC host system
- Developed various real-time graphics display strategies for PC-based user interfaces
- Developed manufacturing and field service diagnostic software for testing and troubleshooting to component level

General Electric Medical Systems
April 1987 to August 1987

CONSULTANT
RANCHO CORDOVA, CA

- Ported and modified Motorola's VME-117 Debug Monitor (assembly language) for use in real-time, multitasking, multiprocessor, MC68010-based diagnostic ultrasound imaging system operating under VRTX
- Member of hardware diagnostics group responsible for system power-up and performance diagnostic software (C, assembly language)

Atkinson System Technologies Co.
August 1986 to March 1987

SOFTWARE ENGINEER II
SACRAMENTO, CA

- Developed real-time assembly language firmware for Z80-based multitasking, multiprocessor, industrial mobile telecommunication systems
- Assisted in the design and implementation of an RF-based, automatic vehicle location system using a proprietary real-time executive

EMS Software
August 1984 to March 1994

CONSULTANT
PLEASANT GROVE, CA

- Developed custom agricultural land leveling software for personal computers
- Responsibilities included a full rewrite of product to incorporate full VGA graphical user interface (GUI) using Microsoft BASIC PDS 7.1 and various third-party graphics libraries
- The product, PC Leveler, features enhanced field design entry with mouse control, on-screen cut/fill maps and design results, 2-D contour maps, 3-D surface plots, context-sensitive on-line help, and user-controlled configuration including user-defined printer definitions

Education

California State University Sacramento — **November 1986**
Master of Science, Biomedical Engineering — Sacramento, CA

- Thesis: A Prototype Microcomputer-based Arrhythmia Monitoring System

University of California Davis — **June 1982**
Bachelor of Science, Electrical & Computer Engineering — Davis, CA

- Area of specialization: Computers

Miscellaneous Technical Skills

- Analog and digital hardware design (using Altium, PADS, KiCad, DipTrace, OrCAD, Tango, Protel), prototype development, debugging
- Programmable-logic (CPLD/FPGA) design (using Xilinx, Altera, Lattice) in VHDL
- Hardware debugging with JTAG/BDM debuggers (Segger, IAR, ST-Link, MCU-Link), in-circuit emulators (EST, ZAX, American Arium, HMI, Nohau, Orion, Applied Microsystems), logic analyzers (HP, American Arium, Orion, Pod-A-Lyzer), scopes (HP, Tektronix), and other cross-development tools
- Embedded microprocessor software development with STM32CubeIDE, STM32CubeMX, PSoC Creator, IAR EWARM, TI Code Composer Studio with DSP/BIOS, Atmel Studio, Microchip MPLAB, Keil MicroVision, NXP MCUXpresso, Renesas e^2 studio
- Fluent in the following languages:
  C/C++, C# (Borland/Embarcadero, Microsoft/MFC, Watcom), Assembly Language, Pascal, FORTRAN, BASIC, LISP, FORTH, Delphi, LabWindows/CVI
- Experienced with source code control systems such as SVN, Git, SCCS, PVCS, Visual SourceSafe
- Design experience with the following microprocessor and microcontroller families:
  ATSAMS70, STM32, STM8, Rockchip ARM Cortex, Freescale/NXP LPC82x/84x/55x06, OMAPL137, TMS320C6748, MSP430, Atmel AT91, AVR, Intel x86, Hitachi SH4, ColdFire MCF5206e, MC680x0, MC68302, MC68340, MC68360, Z8, Z80, 8080, 8051 & derivatives, 8xC196, M6805, 6502, dsPIC33, PIC16C6x, PIC16C73/74, PIC16F87x, PIC18F4550, PIC18F2455, CY8C4200 family, CY8C52LP family, Renesas RA6M2
- Real-mode and protected-mode programming for real-time x86 applications