ANDREW M. SIFFERMAN

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Summary

Highly experienced Embedded Systems Design Engineer and Engineering Manager. Proven track record developing real-time embedded firmware and hardware for new products from concept through prototype, and into manufacturing. Self-motivated drive for excellence. Product-focused. Detail-oriented. Strong work ethic. Self-starter. Team player. Enthusiastic learner. Patient mentor. Creative problem solver.

Remote-work Ready. I have a lab in my home outfitted for embedded systems development: digital and analog oscilloscopes, logic analyzer, function generators, DC power supply, SMD soldering tools, PCs, webcam, high-speed internet.

Technical Skills

Software:

- **Real-time embedded firmware design**: Data acquisition, control of hardware, signal processing, communication.
- **High-level languages**: Proficient in C, C++11. Experience with Python, Perl, JavaScript, C++/CLI .NET, Objective C, C#, Visual Basic, HTML, CSS.
- **Assembly languages**: ARM, SHARC, Blackfin, PIC, XMOS xCORE-200, 8051, HC11, H8, and many other processors.
- **DSP**: Practical application of Digital Signal Processing techniques: FIR and IIR filters, FFT, convolution, correlation, decimation, interpolation, windowing.
- **Interfaces**: USB, CAN, SPI, I^2C, I^2S, RS-232, RS-422/RS-485, custom (open drain, bit-bang); Wi-Fi and Bluetooth modules.
- **Protocols**: TCP/IP, JSON, XML, Protocol Buffers, MCAPI, IEEE488.2, SCPI, NMEA 2000, MIDI, proprietary.
- **RTOS**: Bare metal, FreeRTOS, TI-RTOS (SYS/BIOS), VDK (VisualDSP++ Kernel for Blackfin). Preemptive and cooperative multitasking.
- **Software Design**: Object-oriented design. Design patterns. API design. Unit testing.
- **Development environments**: MS Visual Studio, Xcode, GNU/Eclipse and many variants, Keil, CodeWarrior, MPLAB, IAR, LabWindows/CVI, LabVIEW, VisualDSP++, others.
- **Source control**: Perforce, Subversion, Source Safe, PVCS.
- **Software/hardware integration**: Prototype bring-up and debugging using in-circuit debuggers and emulators, oscilloscope, logic analyzer, etc.
- **Human factors**: GUI and man/machine interface design for custom embedded devices. App design. Responsive web design.

Hardware:

- Design of system architecture based on 8, 16, and 32-bit embedded MCUs and DSPs.
- Digital and analog circuit design.
- Schematic capture: OrCAD, KiCad, TinyCAD, Viewlogic. Multilevel BOMs.
- PCB layout and design, fabrication drawings, assembly drawings.
- Design for optimal cost/performance tradeoff.
- Design for testability; development of custom production test equipment.
- Design for EMC (Electromagnetic Compliance).

Technical writing: Specifications, source code documentation, API documentation, test procedures, operator's manuals, technical manuals, online help. Very clear and thorough written communicator. Proficient with Doxygen.

Experience

11/2020 – Present   FRACTAL AUDIO SYSTEMS, Plaistow, NH

Embedded Software Engineer

- Perform board bring-up, create hardware drivers in C, and write test and GUI firmware in C++ for a next-generation guitar effects processor based on a TI multicore DSP+ARM.
- Use TI-RTOS (SYS/BIOS) and XDCtools on both DSP and ARM cores.
- Write detailed documentation for other design team members.
- Work 100% remotely, plus a 1-hour weekly in-office meeting.

5/2017 – 4/2020   CONNECTED SYSTEMS PARTNERS, Chelmsford, MA

Consulting Firmware Engineer

- Coded firmware in xC and C++11 for a lab-quality data acquisition instrument for use in electroacoustic test systems.
- Designed, documented, and coded two APIs:
  - A host-to-instrument API based on SCPI over USBTMC.
  - An inter-core C-based API for control of a HAL via MCAPI.
- Wrote test scripts in Python, using Pytest.
- Followed Scrum methodology for all assigned tasks. Participated in sprint planning, background grooming, sprint retrospectives. Proficient with Jira.
- Worked remotely from my home office, with frequent collaboration with team members via GotoMeeting and Slack, and on-site trips to client facility as needed.

11/2016 – 3/2017   DEGREE CONTROLS, Milford, NH

Firmware Engineer

- Technical oversight of firmware development for a new fan speed controller product.
- Authored several detailed product design specifications for hardware, embedded firmware, application software, and a verification/validation test plan.

10/2010 – 7/2016   SIFFERMAN TECHNOLOGY, LLC., Bedford, NH

Principal

Went out on my own to develop a wireless recreational black box fish finder product intended for use with smart phones, tablets, and other platforms.

- Project was self-funded.
- Visited trade shows to gauge market interest and follow competitive trends.
- Developed hardware, firmware, and all documentation for the product. Designed schematic and 4-layer PCB. Manufactured 8 prototypes.

- Created a fully documented, platform-independent C++ API to allow use of the product with apps running on iOS, Android, Windows, Linux, and other platforms. (http://siffermantechnology.com/stfishfinder-api/)
- Hired a contract engineer to develop an iOS app.
- Project was discontinued due to changing market conditions and depletion of funding.

11/2010 – 1/2013   3M TOUCH SYSTEMS, Methuen, MA

Product Development Specialist

- Team contributor in the development of a new 46-inch projected capacitive multi-touch display product supporting 60 simultaneous touches. Adapted existing firmware from a smaller display controller to the larger format.
- Served as mentor to two engineer colleagues.
- Received 3M's Circle of Technical Excellence and Innovation Award in 2011.

4/2008 – 12/2009   BITWAVE SEMICONDUCTOR, Lowell, MA

Senior Software Engineer

Contributed as a team member in coding software for configuration, calibration, and control of a programmable cellular SDR (Software-Defined Radio) chip. This included:

- Writing an IDE (Integrated Development Environment) application using C++/CLI .NET and Visual Basic.
- Coding an API in C to allow a baseband processor to communicate with the chip.
- Designing firmware in C and assembler for an 8051 CPU embedded within the transceiver chip.

11/1999 – 3/2007   AIRMAR TECHNOLOGY, Milford, NH

Senior Electrical Engineer; Software Section Manager

- Principal software engineer in the development of a marine weather station product. Developed algorithms to calculate true wind velocity (magnitude and direction) despite complex motion of sensor on a sailboat mast. Fully responsible for software design specification, and wrote all firmware in the product.
- Improved algorithms and enhanced performance in an electronic water speed sensor that determines speed of flow using autocorrelation and cross correlation of high frequency sonar echoes from microscopic particles in the water. One patent.
- Proposed and developed an encrypted flash bootloader to allow secure field updates to embedded application firmware in all Airmar smart sensors.
- Conceptualized and implemented the Airmar Xducer ID® feature, where a tiny PIC microcontroller is embedded in certain models of sonar transducers, and which contains in EEPROM all important operating parameters regarding that transducer, so that an echosounder can query the chip over a single wire bus and customize its own impedance, transmitter power and frequency, etc. to optimize performance. One patent.
- Wrote detailed design specifications (100+ pages each) for several new sensor products based on the NMEA 2000 CAN bus standard, including a family of GPS/compass/rate gyro products and several variants of smart depth/speed/temperature sensors.

- From 2004-2007, managed and supervised the daily activities of a small team of senior software engineers. Interviewed, hired (and fired when necessary); delegated tasks and tracked progress; wrote and presented performance appraisals.
- Served on the NMEA 2000® Standards Committee (National Marine Electronics Association).

11/1994 – 11/1999   RAYTHEON MARINE COMPANY, Manchester, NH

Senior Development Engineer, Recreational Engineering

Served as the creative lead in a start-up design team developing a new line of fish finder products.

- Designed the system architecture, and coded about half of the firmware. Authored several efficient signal processing algorithms in assembly language and C.
- Supervised the development of the remaining code. Assigned coding tasks to other developers. Conducted design reviews.
- Designed and implemented hardware and software for automated end-of-line production test for high volume manufacturing.
- Trained manufacturing personnel in Taiwan, Spain, U.K., and U.S. production lines.
- Received Raytheon's Thomas L. Phillips Award for Excellence in Technology in 1996.

Education

B.S. Electrical Engineering, University of California, Berkeley
Emphasis: Computer Hardware and Software.

Awards

- U.S. Patent 7,369,458, *Transducer Identification*, issued May 6, 2008.
- U.S. Patent 6,678,208, *Range Computations for Correlation Speed Sensor*, issued January 13, 2004.
- Circle of Technical Excellence and Innovation Award, 3M Company, 2011, for Excellence and Innovation in Team-Driven Technical Achievement.
- The Thomas L. Phillips Award for Excellence in Technology, Raytheon Company 1996, for Development of Depth Sounder Products.

Affiliations

- Senior Member, Institute of Electrical and Electronics Engineers.
- Certified Engineer-In-Training, State of California.

On the Web

- Web site: http://siffermantechnology.com
- LinkedIn: https://www.linkedin.com/in/andysifferman
- Stack Overflow: http://stackoverflow.com/users/3958633/sifferman
- The most recent version of my résumé can be found at http://siffermantechnology.com/resume.

References

Provided on request.