David Smith Electronic Engineer

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Summary

Electronic design engineer with more than fifteen years experience designing analog and mixed-signal electronic circuits, with particular expertise in precision, low-noise sensing and signal processing and integration with embedded microcontrollers. Applications include electronics combined with optical, mechanical and fluid measurement and control.

Approach and Key Assets

- Bring a big-picture approach to product design, considering development time, manufacturability, usability, field support, adaptability to other applications
- Apply real-world experience with many different technologies (analog/digital, software/hardware) to select optimal solutions for based on time, cost and volume
- Can write, present and summarize effectively for technical and non-technical audiences (Can explain “what it does” to a programmer, a manager or a customer)
- Continually enthusiastic about inventing, improving, automating, simplifying, connecting and making things
- Design solutions that work well, look good and operate intuitively

Expertise, Tools, Technologies

Signal Conditioning: differential measurement, pass-band shaping and filtering, surge suppression, noise reduction, EMI control, modulation and demodulation, envelope detection and gain control

Hardware Design: digital peripherals, analog instruments, switching power supplies, CAN, RS232 USB, I2C, SPI, active and passive filters, servo and stepper motors, solenoid valves

Circuit design and simulation: OrCAD, LTspice, pSpice, FilterDesigner and PCB Layout tools

Firmware: code for embedded microcontrollers (Atmel, Intel, STmicro, Microchip) in Basic, Wiring and C. High-level hardware/software interfaces using C, Lingo & LiveCode 4GLs

Test: fixture design for in-house engineering testing, production line, semi-auto setups for sequencing, burn-in, leak-testing, light radiance and reflectance, frequency and magnetic flux

Education

B.S. Electrical Engineering, UC Santa Barbara

B.A. Physics, UC Santa Barbara

More Information

Additional project design details are available online at *engineering.ninetrees.com*.

Companies and Projects

Cyberonics 2013 – Present

- Analyzed existing and future designs for medical implants and ECG sensors. Recommended design improvements to circuits for more robust power, cost reduction and testing methods streamline production and increase yields
- Conducted electrical characterization of latest version of nerve stimulation implant device and performed analysis of electrical tolerances and performance limits

Microphor 2011 – 2012, 1995 – 2002 as consultant

- As engineering director, managed the mechanical engineering design team. Designed the electronics and firmware for a new constant vacuum waste control system. Contract awarded upon successful production first article [Amtrak]
- Designed improvements for *Peltier* electric refrigerators to better withstand the harsh electrical environment on railroad locomotives
- Reduced board test time by 80% by developing a ten-station burn-in sequencer for production PCB assembly testing [PLC-based]

Trimble Navigation 2009 – 2011

- Developed three generations of *GreenSeeker* optical sensors for precision agriculture to measure plant biomass for real-time mapping and fertilizer application to wheat, corn and other crops. Improved accuracy by 10 times and doubled operating range

NTech Industries 2001 – 2009

- Developed next-generation optical detection sensors using modulated multi-band light emitters and detectors, precision valve control and spraying. Increased field-of-view and improved temperature tracking; reduced power and calibration time
- Implemented system design, circuit and software for a real-time delay controller used on railways in U.S and Europe. Variable speed operation for spot-spraying to 24 MPH

MicroSource 1989 – 1991

- Designed voltage control and temperature compensation to stabilize frequency for 12 GHz YIG oscillators used in RF spectrum analyzers and aircraft transceivers
- Planned and assembled a comprehensive test system for RF radio transmitters integrating frequency and voltage and s-parameter analyzers over HP-IB bus. Supervised development of the control software for instrument and code modularity

Acroamatics 1986 – 1989

- Designed telemetry signal bit synchronizer with a 2,000,000:1 frequency range for extracting data from direct or recorded data signals using NRZ and other time codes
- Complete design of a PLL frequency synthesizer as part of a naval remote data retrieval system. Six-decade range of operation with direct synthesis to 90MHz

Nine Trees Design 1989 – Present

- As a consultant, developed prototypes and commercial products including system strategy, schematics, PCB design, microcontroller code, and production test fixtures