

Career Experience Highlights Snoqualmie, WA • (858) 610-4870 • JMetzner2@gmail.com

Fresh Consulting, Inc – Bellevue, WA Sept 21' – Present

Sr. Electrical Engineer

- ❖ Schematic/PCB development, robotics, IoT applications/development, firmware, system level design, test fixture development, various sensing technologies, PLCs, motion control, wearables.

GE Healthcare and Leica Microsystems – Issaquah, WA March 13' – Sept 21'

Lead Electrical Engineer

- ❖ Design electrical subsystems for high resolution automated microscopy imaging including system level architecture, PCBA, embedded systems (uP, FPGA, CPLD), and motion control design.
- ❖ Touchscreen/LCD design, various sensing techniques, stepper and brushless DC motors, reliability analysis and life testing, incubation systems, high power/speed illumination.
- ❖ Gas/humidity/temp sensing, mass flow controllers, solenoid actuation, galvanometer control.
- ❖ Engaging in all phases of new product introduction, including concept, architecture, documentation, design, prototype, test, supplier interfaces, manufacturing and service support.
- ❖ Lead electrical engineering activities with overall responsibility for the design and development of all electrical subsystems. Establish priorities, allocate resources, and drive technical projects.

Allergan Medical – Goleta, CA July 10' – March 13'

Sr. Product Development Engineer

- ❖ Experience with leading several projects/tasks for Class 3 medical devices, concept development, design requirements, coordinating staff, identifying scope, budget, and timelines.
- ❖ Managed and designed Electrical/Software for several test fixtures including various sensing, fatigue tests, Brushed/BLDC motors, manufacturing, HMI, and data acquisition/manipulation.
- ❖ Inductive power design, RF communication/transmission, and a variety of applications using accelerometers, pressure, force, temperature, flow sensors, and means for harvesting energy.
- ❖ Schematics/PCB design, simulation, layout, assembly, test, and debug, embedded microprocessor based controller design. Analog/Digital mixed signal circuit design.

Equipment and Software

- ❖ Test equipment: Oscilloscope, Waveform Generator, Spectrum Analyzer, Network Analyzer, Power Meter, Pulse Counter, Programmable Power Supply, Data Acquisition Units, Current Probe, RF Probe, Motor Torque/Speed Test Systems, Allen Bradley, Various PLCs.
- ❖ Software: Altium, OrCAD, Solidworks, Autodesk Inventor, LabVIEW, IAR, Atmel Studio, Microsoft Word, Project, Excel, Visio and Visual Studio, Quartus II, Visual Studio++, Xilinx, Eclipse, Keil, MCUXpresso, and Codewarrior. Perforce, Subversion, Microsoft Access Database.
- ❖ Programming Languages: VHDL, C, C++, Python, VBA, HTML, various PLC languages
MCU/MPU's: TI MSP430, Atmel AVR and ARM (XMega, ATTiny, SAM), Freescale Coldfire, Analog Devices Blackfin, NXP LPC ARMs.
FPGA/CPLD: Xilinx Spartan and Altera Cyclone/Max10 chip families.

Education and Training

Cal Poly, San Luis Obispo, CA (2004 - 2009)
BS in Electrical Engineering (Focus in RF)
Additional coursework in ME and Physics

- ◆ OrCAD PCB Editor and Capture Training
- ◆ Labview Core 1/Core 2 Training

- ◆ Altium Intro and Advanced Schematic/PCB Training
- ◆ Synthworks Comprehensive VHDL Training
- ◆ GE Certified Reliability Practitioner
- ◆ GE Project Management - Crotonville
- ◆ GE Foundations of Leadership – Crotonville
- ◆ GE Building Essential Leadership Skills – Crotonville

PATENTS

2015149031,20150142044,20150093362,20150094753,20140350517,20140276384,20130190892,20130190557,20120095497,20120095494

Metzner Prototyping, LLC

www.metznerprototyping.com

Owner, Sole Proprietor – Snoqualmie, WA June 13' – Present

Over 100 projects in 9+ years of consulting - from bowling ball implants to class 3 medical devices

Some projects include (pictures can be found on my website in the portfolio section):

- ❖ System that delivers high power to several LED banks (+48VDC) for UV sterilization. Includes power delivery with individual brightness control, touchscreen display and keypad.
- ❖ Battery-powered medical device that treats patients through a heated element. Electronics consist of an OLED screen, thermistor, heater, battery management, RTC component, main processor and small, secondary processor.
- ❖ Polygraph system with various wearable sensors, including blood pressure, muscle monitor via piezo actuation, electro-dermal activity, body temperature, heartrate and spO2.
- ❖ Sch/PCB design for a USB dongle. Consists of USB 3.0 hubs, display port to HDMI, micro and normal SD card readers, USB C power controller and charger management for power delivery (100W), various power management, memory storage and parallel interface.
- ❖ Sch/PCB design for a device used in a smart home application. Consists of a mount for a Qualcomm based processor and several high-speed signals to sensors and connectors.
- ❖ Sch/PCB design proprietary triggering method on a drum. Sound playback via an audio jack and GUI (connected via USB), files stored on a local SD card.
- ❖ 2-piece wirelessly controlled, battery-operated, pet training system that contains a high frequency transducer and a Bluetooth Module using an RSSI distancing algorithm.
- ❖ Remote-controlled, high-power LED system, powered wirelessly (via inductive power). Includes base inductive/RF transmitter for command/control of LED brightness.
- ❖ Battery powered controller that integrates with an airsoft rifle. Interfaces to an OLED display for trigger/firing settings and switches/buttons to navigate the menu.
- ❖ Small, compact data logger embedded in a firearm that collects location and device orientation/motion. Includes BLE, GPS, 1GB flash, and 9-axis motion sensing.
- ❖ Wearable device that is used for a proprietary therapeutic application with an accompanying app for iOS devices (Class 3 medical device). The device includes a touchscreen display, bluetooth module, accelerometer, buzzer, re-chargeable battery and circuitry for charging support, and high voltage delivery (>100V) on several analog channels.
- ❖ Several technical articles published on Arrow.com, Eetimes, and ti.com. Some include:
 - *Designing a Compact Small Signal Chain*
 - *Electronics inside the Human Microbiome*
 - *Bluetooth Technologies and Solutions*
 - *Taking a Quantum Leap in Cryptography and Computing*
 - *Artificial Intelligence in the Industry*
 - *Improve the Performance of Industrial and Medical Applications with Modular Power Supplies*
 - *Re-imagining Today's Isolation Solutions for Tomorrow's Technologies*

Sample PCBAs available for show and tell but most project application detail is confidential.

My Equipment and Software

- ❖ Equipment: Oscilloscope, Waveform Generator, Programmable Power Supply, Multimeter, DC Electronic Load, Various Data Acquisition Units, Reflow Oven, Microscope, Rework Materials.
- ❖ Software: Altium, MCUXpresso, Microsoft Word, Project, Excel, Visio and Visual Studio.