Aria Chen

Senior Electrical Engineer

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PROFESSIONAL SUMMARY

Results-driven Senior Electrical Engineer with over 10 years of experience in power electronics, embedded systems, and mixed-signal circuit design. Proven track record of leading cross-functional teams through full product lifecycles from architecture through UL/CE certification. Expertise in high-voltage power stages, FPGA-based real-time control, and cost-optimized PCB design for volume manufacturing. Passionate about developing energy-efficient solutions that bridge the gap between cutting-edge research and commercially viable products.

TECHNICAL SKILLS

Hardware Design & PCB

Altium Designer, KiCad, Cadence OrCAD, 16-layer HDI layout, mixed-signal PCB, signal integrity, EMI/EMC pre-compliance, DFM/DFA analysis, thermal management

Embedded Systems & FPGA

ARM Cortex-M (STM32, NXP), Xilinx Zynq, Verilog/VHDL, FreeRTOS, real-time control loops, CAN/SPI/I2C/UART, sensor fusion, motor control algorithms

Power Electronics

DC-DC converters (buck, boost, LLC resonant), SiC/GaN gate driver design, 3-phase inverters, PFC stages, battery management systems (BMS), 50 kW+ power stages

Software & Simulation

MATLAB/Simulink, Python (NumPy, SciPy), C/C++, LTspice, PLECS, ANSYS Maxwell, Git, Jira, Confluence, CI/CD for firmware

Test & Measurement

Oscilloscopes (Keysight, Tektronix), spectrum analyzers, network analyzers, logic analyzers, thermal chambers, automated test with Python and LabVIEW

Standards & Compliance

UL 1741, IEC 61000, IPC Class 3, ISO 26262 (ASIL-B), FCC Part 15, MIL-STD-461, DO-160

PROFESSIONAL EXPERIENCE

Vertex Power Systems

2019 – Present

Senior Electrical Engineer | Austin, TX

- Led the electrical architecture and validation of a 50 kW bidirectional EV charger power stage, achieving 97.2% peak efficiency with SiC MOSFET modules and DSP-based digital control.
- Architected multi-layer protection circuitry including overcurrent, overvoltage, and arc-fault detection, achieving 99.7% fault coverage in HIL testing.
- Managed a team of 4 hardware engineers through complete product lifecycle from concept and schematic capture to UL 1741 certification and pilot production.
- Reduced BOM cost by 22% through strategic component selection, supplier consolidation, and design-for-cost optimization without compromising reliability margins.
- Designed isolated gate driver circuits with active Miller clamping for 1200 V SiC power modules, validated across full temperature range (–40°C to +125°C).
- Collaborated with mechanical and firmware teams on thermal management strategy, implementing forced-air cooling with custom heatsink profiles validated via CFD simulation.

Nimbus Technologies

2016 – 2019

Electrical Engineer | Portland, OR

- Developed embedded control hardware for next-generation industrial automation platforms, integrating STM32H7 MCUs with real-time EtherCAT communication.
- Designed 12-layer mixed-signal PCBs with controlled-impedance differential pairs for high-speed serial links up to 5 Gbps.
- Implemented FPGA-based (Xilinx Artix-7) real-time motor control algorithms achieving sub-10 µs control loop latency for multi-axis servo drives.
- Authored comprehensive design verification test plans and led IEC 61000-4 EMC compliance testing at an accredited third-party laboratory.
- Drove adoption of automated Design Rule Checking pipelines, reducing PCB respin rate by 35% across the hardware engineering group.

Meridian Electronics

2014 – 2016

Junior Electrical Engineer | San Jose, CA

- Designed and characterized low-noise analog front-end circuits for precision current measurement instruments, achieving 18-bit effective resolution at 100 kSPS.
- Performed extensive SPICE simulation, Monte Carlo analysis, and worst-case circuit analysis for multi-rail power supply designs used in medical imaging equipment.
- Developed automated Python-based test scripts integrating bench instruments via SCPI commands, reducing validation cycle time by 40%.
- Supported transition of low-noise amplifier modules from prototype to volume manufacturing, resolving yield issues through root-cause analysis and process optimization.

EDUCATION

M.S. Electrical Engineering | Power Electronics & Control Systems
Stanford University, Stanford, CA — 2012 – 2014

B.S. Electrical Engineering | Minor in Computer Science
Georgia Institute of Technology, Atlanta, GA — 2008 – 2012

CERTIFICATIONS & LICENSES

Professional Engineer (PE) – Electrical & Computer: Power
Texas Board of Professional Engineers, License #48721 — Issued 2018

Certified LabVIEW Developer (CLD)
National Instruments — Issued 2015

IPC CID+ – Advanced Certified Interconnect Designer
IPC – Association Connecting Electronics Industries — Issued 2017

KEY PROJECTS

Smart Grid Power Quality Analyzer

Vertex Power Systems, 2021–2022

Designed a DIN-rail mounted power quality monitoring unit for utility substation deployment. The device performs real-time harmonic analysis (up to 63rd harmonic), voltage sag/swell detection, and IEEE 1459 power calculations on a dual-core ARM Cortex-M7 processor. Features isolated analog front-end with 24-bit delta-sigma ADCs, cellular backhaul via LTE-M modem, and Modbus/DNP3 integration with existing SCADA infrastructure. Achieved Class A accuracy per IEC 61000-4-30 and successfully completed a 6-month field trial across 3 substation sites.

High-Efficiency LLC Resonant Converter

Vertex Power Systems, 2020

Developed a 3.3 kW LLC resonant DC-DC converter for data center power supply applications. The design uses a full-bridge topology with GaN HEMTs switching at 350 kHz, achieving 96.4% peak efficiency and a flat efficiency curve across 30%–100% load range. Implemented digital synchronous rectification with adaptive dead-time optimization that recovers an additional 0.8% efficiency at light loads. The magnetics design uses a planar transformer with integrated leakage inductance, eliminating a separate resonant inductor and reducing the converter footprint by 28% compared to discrete implementations.

Industrial IoT Wireless Sensor Node

Nimbus Technologies, 2017–2018

Designed an ultra-low-power wireless sensor node for industrial condition monitoring. The system combines a MEMS accelerometer, temperature/humidity sensor, and a sub-GHz radio transceiver on a coin-cell-powered platform. Achieved 5-year estimated battery life on a single CR2450 cell through aggressive duty cycling, sub-threshold voltage references, and a custom energy-harvesting power management IC that scavenges from a micro TEG. Deployed 200+ units across a paper mill facility for predictive maintenance of rotating equipment, reducing unplanned downtime by 31% in the first year.

Automated Production Test System Meridian Electronics, 2015–2016

Built an automated production test platform for calibrating and validating precision analog measurement modules. The system integrates a 6.5-digit DMM, programmable power supply, arbitrary waveform generator, and a custom switching matrix controlled via a Python test executive. Reduced per-unit test time from 18 minutes to 4.5 minutes while improving measurement repeatability by 3×. Generated comprehensive test reports with statistical process control charts, enabling real-time yield monitoring on the factory floor.