

Education

University of California, Santa Cruz

September 2013 – June 2017

Bachelor of Science with Honors in Computer Engineering with a focus on Digital Hardware.

Experience

Generac Clean Energy

September 2023 – May 2025

Staff Firmware Engineer

Remote

- Developed embedded control systems for managing PLC-based communications with microinverters via a Yitran PLC chip.
- Designed and implemented automatic set/verify routines for grid profiles, max power limits (including PTO states), and microinverter calibration/control parameters.
- Created robust CLI and CAN-based interfaces to enable full microinverter control, diagnostics, and calibration from external systems.
- Built a protocol translation layer to map SunSpec data models to a proprietary microinverter protocol, supporting DER compliance.
- Participated in and supported IEEE 2030.5 (CSIP) compliance testing, ensuring protocol alignment and interoperability.
- Engineered a grid phase-lock mechanism based on voltage thresholds, replacing zero-cross detection and significantly improving PLC stability on noisy grids.
- Designed a next-generation remote control P2P protocol that re-implemented GUI objects on the client side (Java) rather than transmitting raw screen captures—improving responsiveness from 10s/frame to ~0.5s/frame.

SunPower Corp

November 2018 – September 2023

Staff Firmware Engineer

Remote / Richmond, CA

- Lead engineering efforts to work around supply chain constraints in order to ensure product supply continuity – determined alternate components and implemented manufacturing and production support.
- Maintained product supply throughout the supply chain crisis by developing creative solutions for alternate hardware designs and components.
- Lead team of 5 developers for legacy product sustaining work. This included designing creative solutions for reducing flash degradation and developing support for IEEE1547-2018 regulatory requirements.
- Architecture design and BSP bring-up for the next generation SunVault (energy storage) product.
- Developed firmware that enabled and improved communications between the PV supervisor (PVS6) and the devices it monitors/controls. Heavy focus on Enphase IQ7 micro inverters communications and support.
- Worked with utilities to support regulatory requests such as HECO, Rule21/IEEE2030.5, and IEEE1547 based grid profiles.
- Brought up firmware for municipal interconnect disconnect controller (MIDc) which manages the grid disconnect contactor switch for SunVault systems.
- Network stack support for BG95/96 modules.

Skills

10yrs: Embedded Systems: (STM32, IMX6/8, PSoC, Atmel, RTOS/FPGA, NI cRIO, Xilinx FPGA, Arduino)

10yrs: Git for large scale version control and project development.

4yrs: CI/CD (Yocto, GitHub Actions) for building projects.

4yrs: DER Regulatory Requirements (IEEE2030.5 CSIP, IEEE1547, CA-Rule21, HECO)

4yrs: Inverters (Chilicon Power / PWRMicro, Enphase IQ7, SolarBridge, Delta, SMA)

3yrs: Broadband and Cellular Embedded Support

3yrs: Team Management (Direct hires and contractors)

3yrs: Digital and Analog Circuit Design and Analysis

Solar Tech:

Enphase IQ7
SolarBridge Mis
Chilicon Power
BMS / ESS
MIDC (Storage
Disconnect
Controller)
Metering
Commissioning
IEEE2030.5
IEEE1547
HECO
CA-Rule21

Programming:

C/C++
Python
Bash
Batch
Yocto/Bitbake
Javascript
Java
JSON
XML
ProtoBuf
FlatBuf
Swagger

Software:

VMWare/VirtualBox
VIM
VS Code
Git
PuTTY
MobaXTerm
WireShark
PSoC Creator
Microchip/Atmel
Studio
Xilinx Suite

Device Comms:

UART
I2C
SPI
USB
PLC
CAN
Modbus
Sunspec
AT (for BG95/96)
MQTT
AWS IOT
COBS
HSSP (for PSoC4)

Hardware & OS:

STM32
NXP LPC-17xx
IMX6, IMX8
PSoC4 PSoC5
Atmel SAM
NI Crio
Zephyr
FreeRTOS
Windows
Linux (Ubuntu)
U-Boot