Resume - Matthew Stephen Smith – Electronics Engineer

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Portfolio: matt6626.github.io/portfolio.pdf

ABOUT

2+ years as an electrical engineer with an interest in hardware and software design for power electronics and control systems, particularly in relation to renewable energy.

SKILLS

Programming: C,C#, Matlab, Python, HTML, JavaScript   **Software:** Altium, Kicad, Matlab/Simulink, LTSpice, CAD
Embedded Systems: Arduino, Atmel, Espressif, STM, FPGA   **Platforms:** Windows, MacOS, Linux
Workplace Collaboration/Documentation platforms: Jira, Salesforce

EXPERIENCE

TRITIUM Murarrie, QLD
Customer Support Engineer   **August 2020 - Present**

- Technical engineering support for a global fleet of high-power electric vehicle DC fast chargers
- Provision of technical support, product information, product installation and usage guidance, and asset data reporting to customers globally, via phone and online (Salesforce) systems
- Maintaining relationships with customers through provision of timely support, ensuring fast resolution of product faults, optimal charging performance, a seamless end-user usage experience, and maintaining overall charger network uptime
- Participating and innovating the best practices and processes involved in delivering a high-quality customer experience from customer acquisition, to installation, commissioning, and throughout the operational lifetime of the product
- Diagnostics and repair of software, electrical, and mechanical faults both remotely and on-site
- Development of BASH scripts, and python scripts to aid in interactions/diagnostics with the onboard, embedded Linux platform, and for parsing/plotting of CAN bus diagnostic data
- Creating and documenting technical diagnostics procedures for software issues and for field service diagnostics and repairs
- Training of customer support staff, and field service technicians in safely performing diagnostics/repairs on high-power, high-voltage chargers
- Maintaining relationships with external service partners, providing guidance/auditing throughout during their involvement in charger repair and installation, to ensure all services rendered on Tritium products are performed to a high-quality and consistent standard
- Assisting with root cause analysis and documentation/tracking of software and hardware issues identified in-situ per ISO9001:2015 standards and similar
- Working with the design engineering team in identifying, documenting, and defining requirements for product improvements/features
- Performing integration, validation, and verification testing on hardware and software revisions in collaboration with design and test engineers
- Participating/collaborating with design, test, and quality engineers to understand and support the overall operation of all aspects of a complex power electronics product which is controlled by an extensive software base.
- Supporting product sales representatives by providing technical insights in regards to the products capabilities and specifications

MACHINEMONITOR Banyo, QLD   **January 2019 - August 2020**
Electrical Engineer

- Condition monitoring of rotating machines (high-power motors and generators) including risk assessment, predicted failure mechanisms, and recommended maintenance
- Performing/interpreting a range of high-voltage (1 kV – 79 kV) condition assessment tests including insulation resistance/polarisation index, dielectric dissipation factor, partial discharge, and DC ionisation
- Performing witness testing on rotating machines that have undergone repair/reconstruction
- Prototyping models of motor/generator insulation systems for assessing insulation testing methodology
- Maintaining and calibrating test equipment to ensure traceable and accurate test results for compliance with testing and quality standards

EXPERIENCE CONTINUED

December 2018 - January 2019

ARC HARDWARE INCUBATOR Fortitude Valley, QLD
Electronics Engineering Intern
- Engaging with startups to assist developing minimum viable products
- Prototyping experience using CAD, 3D printing, and laser cutting

UNIVERSITY OF QUEENSLAND St Lucia, QLD   **February 2018 - June 2018**
Second Year Electrical Engineering Tutor
- Tutoring for ELEC2003 *Electromechanics & Electronics* by assisting students in practical and theory classes

EDUCATION
UNIVERSITY OF QUEENSLAND St Lucia, QLD   **2015-2019**
- Bachelor of Engineering (Honours) (Electrical Engineering Extended Major)

PROJECTS
Real-time hardware solar panel simulator [work in progress]
- Solar panel simulation with voltage and current control of 1 kW (0-80V output range) isolated full-bridge buck converter
- Simulation of solar panels for converter control based upon five-parameter photovoltaic model to allow simulation of arbitrary solar panels from easily found parameters (Voc, Isc, Vmpp, Impp)
- PFC Boost Rectifier input stage (universal input to 400 VDC) for solar panel simulator
- MPPT (incorporating extremum seeking controller) and single-phase grid tie inverter modules to be designed and developed to aid in testing and verification of the solar panel simulator
- Scale and complexity of project intended to help familiarise understanding and intricacies of all stages of design, modelling, and construction of high-power, isolated, power electronics converter, along with designing robust control systems for power electronics

High-speed, high-linearity, analog triangle wave and duty-cycle controlled PWM generator
- 1 MHz, high-linearity triangle wave generator using full-bridge bi-directional current steering
- Exercise in learning about higher speed, precision analog signal generation
- Small form-factor PCB designed in Kicad

Analysis of digital control systems for grid-connected solar inverters
- Final-year thesis project examining optimal digital control methods for solar inverters
- Extend standard inverter control methods to consider grid-impedance variation for more stable control in wider range of operating conditions (extremum seeking control and online controller tuning)

Electrocardiogram hardware frontend with QRS wave detection
- Constructed a high gain differential amplifier with analog filtering stages for displaying a person's heartbeat
- Considered electrical safety when designing electronics involved in measuring the human body
- DSP detects occurrence of QRS wave (tested in MATLAB and ported to Teensy 2 microcontroller)

Internet of things (IoT) portable monitoring device
- Ultra-compact low power data logger for recording temperature, humidity, and UV index with GPS tracking
- ESP32 microcontroller to interface with sensors and send data securely over WiFi to display in dashboard
- Small form-factor PCB designed in Altium to integrate directly with off-the-shelf ESP32 module

Electronic DC load
- 0-30 V, 0-3 A adjustable electronic load
- Simulation in LTSpice and schematics/PCB designed in Kicad
- Input protection considerations for overvoltage and reverse polarity scenarios
- Thermal simulations and solution using CPU heatsink and fan
- Firmware for digital control and monitoring

REFEREES
Provided on request