Brian Willis

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Education

Western Washington University Graduating June 2019
Major: Electrical Engineering, Electronics Concentration GPA: 3.2/4.0
Minors: Computer Systems, Astronomy, Mathematics

Relevant Experience

Formula SAE CAN-Enabled Data Acquisition Module Sept. 2018 – Present
In-Progress EE Capstone Project with WWU Formula SAE Team

- Proposed the design of CAN-enabled embedded DAQ module on Formula-style racecar.
- Completed peer-reviewed schematic, PCB layout, and BOM for all hardware aspects of design.
- Creating comprehensive hardware and software package: PCB, casing, RTOS library, and manual.
- Implementing ISO 11898-2 high-speed CAN, IP67 protection, software configurability for 5 V 4-20 mA and 12 V digital sensors, and transient power spike/reverse polarity protection.

Satellite Development Intern June – Sept. 2018
SpaceX – Redmond, WA

- Evaluated IMUs and magnetorquers with SpaceX GNC team for Project Starlink's public debut.
- Created procedures for quantifying IMU noise, stability, precision, and frequency responses to find an MVP IMU. Wrote Matlab code to develop DSP filters and analyze IMU test data, and wrote embedded C code to sample, filter, and transmit IMU data in real time on STM32L0 M0+ MCU.
- Performed/refined techniques for degaussing magnetorquers on specific satellite hardware. Wrote embedded C code on STM32L0 M0+ MCU to perform degaussing, emulating satellite.

Other Experience

Head Electronics Mentor of *FIRST Robotics* Team Sept. 2017 – Present
Sehome High School – Bellingham, WA

- Conduct STEM training sessions focusing on electrical fundamentals, soldering, circuit design & troubleshooting, Arduino programming, PCB layout, electronic equipment use, and leadership.
- Assist students in building competitive robot for the *FIRST Robotics Competition* as *FIRST* alumnus.

Rocket Control Panel Aug. 2016 - Present
Custom Interface for Rocketry Simulator *Kerbal Space Program*

- Utilized skills in CAD, digital circuit design, C++, laser-cutting, soldering, and 3D printing.
- Designed custom SPI-controlled GPIO port extenders and UART communications.

Student Engineer June – Sept. 2017
Snohomish Public Utilities District – Everett, WA

- Created, tested, and troubleshot configuration files for substation monitoring systems.
- Developed AutoHotkey scripts to facilitate managing substation equipment databases.

FPGA Arcade Game May – June 2017
Verilog Video Game for EE Department's Video Game Night

- Designed creative and user-friendly game features explained by expressive game manual
- Implemented hierarchical RTL design with peripheral communications, debouncing, and TDM.
- Utilized test bench simulations to troubleshoot and verify designs.

Technical Skills

- Tools: ARM Cortex M0+ & M4 Embedded MCUs, Artix-7 FPGAs, oscilloscopes, and gauss meters.
- Electronics: PCB layout, DSP, RF transmission & reception, active regulators, filters, and amplifiers.
- Laboratory work: Hardware debugging, circuit simulation, documentation, and presentation.
- Teamwork: Git, Jira, Gantt charts, and agile software development cycles in team projects.
- Peripherals: CAN, SPI, I2C, UART, ADC, DAC, DMA, PWM, RTC, PIT
- Software: Altium, Matlab, RTOS (µC/OS-III), SPICE (Multisim), CAD (SolidWorks), Linux, GDB
- Proficiency in: C, C++, Matlab, Assembly (ARM), HDL (Verilog), AutoHotkey, Batch
- Experience with: C#, Python, Java