Brian Willis

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Education

Western Washington University Graduating June 2019
Major: Electrical Engineering, Electronics Concentration GPA: 3.20/4.0
Minors: Computer Systems, Astronomy, Mathematics

Technical Skills

Software Experience

- C, C++, Matlab, ARM Assembly, Verilog
- Kernel scheduling:
  Cooperative and preemptive
  Bare metal time slice and RTOS (µC/OS-III)
- Concurrent/multithreaded programming
- DSP, RF transmission/reception
- CAN, SPI, I2C, UART, ADC, DAC, DMA
- Altium, SPICE, SolidWorks
- Gantt charts, agile software development
- Eclipse, Vivado, Shell, GDB, Git, Jira

Hardware Experience

- PCB layout, hand & reflow soldering
- Embedded MCU development:
  Cortex M0+: Kinetis FRDM KEAZ128
  ST Nucleo STM32L0
  Cortex M4: Kinetis TWR K65F
  Kinetis FRDM K22F
- FPGA development:
  Artix-7: Nexys 4 DDR
- Active regulators, filters, amplifiers
- Oscilloscopes, gauss meters

Engineering Experience

Satellite Development Intern: SpaceX – Redmond, WA 2018

- 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 and refined techniques for degaussing magnetorquers on specific satellite hardware. Wrote embedded C code on STM32L0 M0+ MCU to perform degaussing, emulating satellite.

Head EE Mentor of Robotics Team: Sehome HS – Bellingham, WA 2017 – Present

- 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.

Student Engineer: Snohomish Public Utilities District – Everett, WA 2017

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

Engineering Projects

Capstone: Formula SAE CAN-Enabled DAQ 2018 – Present

- Collaborated with Formula SAE students to propose design of CAN-enabled embedded DAQ.
- Completed peer-reviewed schematic, BOM, and PCB layout and assembly.
- Creating comprehensive hardware and software package: PCB, potted case, RTOS library, and manual.
- Implementing software configurability for 5 V 4-20 mA and 12 V digital sensors.

Embedded Security System 2018

- Created embedded cooperative multitasking security system in C via bare metal time slice scheduling.
- Utilizes electrode touch sensors & keyboard for user configuration, I2C accelerometer for tampering detection, LCD, RTC, ADC for sensor input, DAC for alarm output, CPU load calculator, and watchdog.