

Brendan Engh

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OBJECTIVE

Gaining experience within an innovative space company performing Digital Systems engineering (ASIC/FPGA, Embedded, or Computer Architecture) to advance my career and gain expertise within advanced space systems

EDUCATION

Santa Clara University, Santa Clara, CA

M.S., Electrical & Computer Engineering

Completed March 2024

Focus Area: Digital Systems

B.S., Electrical & Computer Engineering

Completed June 2020

Minor: Computer Science & Engineering

Skills:

Coding Languages: System Verilog, C/C++, Python, JavaScript, RISC-V / ARM Assembly

Software: Vivado, MATLAB, Questa, GitLab & GitHub, DOORS, Kiel, IAR, STM32CubeMX

Devices: Xilinx RF & MP SoC, ARTY100T, STM32 Dev boards, Arduino, PixHawk

WORK EXPERIENCE

Security Clearance: SECRET adjudicated January 2021

Lockheed Martin Space – Silicon Solutions, Sunnyvale, CA

June 2022 - Present

ASIC & FPGA Design Engineer

- Crafted FPGA specifications for radio communication in space, while optimizing for system performance and schedule
- Modeled DSP radio architectures in MATLAB and generated HDL control logic to achieve comm links across 4 FPGAs
- Wrote System Verilog for software control of radio and serial communication, resulting in successful system integration
- Completed all stages of the FPGA design process, from spec flow down to the Vivado Bitstream – led to customer demos
- Demonstrated excellence in interdisciplinary teamwork through innovative solutions and architectural optimizations

Northrop Grumman Space Systems, Hill AFB, UT

December 2020 – April 2022

Electrical Engineer – Lead Battery Project Engineer – Division Team Of Quarter

- Created battery load profiles and test plans; researched 500+ technical documents – led to creation of new specifications
- Conducted Power Study on Launch Facility and Missile Flight Systems; led multifunctional AGILE team to final delivery
- Updated AF drawings: coordinated priorities with AF and vendors – presented to Systems Engineering Review Boards
- Rapidly responded to AF Missile Wing requests; thorough research and analysis reduced failure and maintenance downtime
- Created first-ever data flow diagram of Emergency Launch Power Systems; used daily during system reviews and training

SCU – Robotics Systems Lab, Santa Clara, CA

June 2019 - March 2020

Satellite Operator and Engineering Intern

- United MATLAB and Software Defined Radios – enabled ground communication to NASA and private industry satellites
- Maintained antenna motors; performed calibration tests to ensure reliable uplink; learned the basics of orbital mechanics

RELEVANT PROJECTS

RISC-V Security Core, SCU Research Project Lead

- Created custom RISC-V core using opensource toolchains, resulting in research of RCE and hardware injection attacks
- Added new RV64 instructions, memory encryption and controllable runtime re-encryption for process flow obfuscation
- Unique code pointer encryption within 5-stage pipeline led to negligible performance impact and <7% resource overhead

AI & Machine Learning

- Created 28 x 28 pixel number classifier using an FPGA simulation – used C++ & Vivado HLS; achieved 98% accuracy
- Used TensorFlow and Keras within several AI projects, demonstrating deep learning competency and valuable experience

Adaptive Navigation Utilizing a Drone Cluster, Senior Design

- Researched, designed & integrated GN&C communication hardware systems – multiple drone simultaneous flight control
- Worked with group members to document, present & demonstrate drone system – researched adaptive navigation technology

Embedded Systems

- Built grill probe; integrated microprocessor, GPIO peripherals and circuit components – learned digital systems architecture
- Wrote code control for LED light strip; DSP transformation for microphone inputs determined LED light pattern outputs

INTERESTS

NASA & Space Exploration, Computer Architecture, Skiing, Surfing, Fishing, Traveling, Finance, Podcasts and Audiobooks