Fahad Tajiki

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Education

Purdue University – West Lafayette, IN *Aug 2018 – Dec 2022*
Bachelor of Science in **Electrical Engineering** **UAE Ministry of Education Scholarship**

- Computer Design & Organization
- ASIC Design Lab
- Microprocessor Systems
- Signals & Systems
- Software For Embedded Systems
- Digital System Design
- Advanced C Programming
- Semiconductor Devices

Professional Experience

Saab Middle East LLC. – Abu Dhabi, UAE *Aug 2024 – Present*
Firmware Engineer (FPGA Design)

- **Designed** military-grade **DSP accelerators** for Saab's Coast Control Radar (CCR) with **VHDL RTL** in **Xilinx Vivado**, which **improved detection performance for high-velocity maritime targets** in cluttered environments.
- **Refined** embedded **C++** firmware, **Python** verification pipelines, and **MATLAB** models (Range–Doppler, LP/HP filter design) for coastal-target emulation within the CCR radar signal chain.

Schweitzer Engineering Laboratories, Inc. – Pullman, WA *Mar 2023 – Feb 2024*
Associate Hardware Engineer (FPGA Design)

- **Developed** production-grade **VHDL RTL** for IRIG-B fiber-optic transceivers for calibrated delay-compensation and alignment logic, which accelerated timecode synchronization across the SEL-3405 platform.
- **Optimized timing-critical paths** for IP in **Xilinx Vivado/ModelSim** and built **Python-based regression automation**, which **reduced verification turnaround** and **accelerated product release cycles**.

Research Experience

School of Aeronautics and Astronautics, Purdue University – West Lafayette, IN *Apr 2022 – Jun 2022*
Undergraduate Research Assistant

- **Evaluated ML-based mapping algorithms** for **autonomous drone swarms** and conducted **ROS-integrated flight tests** to characterize collision-failure modes.
- **Produced C/C++** firmware for the **STM32** to acquire sensor data via **ADC** and wrote **Python** scripts for **local positional analysis**.

Teaching Experience

ECE 437 Computer Architecture Lab, Purdue University – West Lafayette, IN *Aug 2022 – Dec 2022*
Undergraduate Teaching Assistant

- **Guided +20 students** through **single-cycle** and **pipelined CPU** design, assisted with debugging of control logic, memory interfaces, and datapath modules with **SystemVerilog RTL** and **MIPS ASM**.

ECE 337 ASIC Design Lab, Purdue University – West Lafayette, IN *Jan 2022 – May 2022*
Undergraduate Teaching Assistant

- **Supervised +30 students** in **standard-cell design** and debugging of **ASIC** modules (FIR filters, APB interfaces) with **SystemVerilog RTL simulation** and **waveform analysis**.

Projects

DNN Accelerator for XOR Functions – GitHub Repository *Mar 2024 – June 2024*

- **Synthesized** a lightweight **DNN accelerator** in **VHDL RTL**, which learned the XOR function and implemented **fixed-point quantization** techniques with a compact pipeline that **minimized LUT** and **flip-flop usage** on an **Artix-7 FPGA**.
- Source: github.com/FAAMT/XOR-NOMADNN

ULTRON (ROS-Based Unmanned Ground Vehicle) – GitHub Repository *Jan 2022 – Jun 2022*

- **Built** a **ROS-based UGV** integrating camera/LiDAR perception, **Python** navigation nodes, and **C/C++** motor-control firmware on a **Raspberry Pi 3B+**, enabling **SLAM (hector_slam)** and **autonomous obstacle avoidance**.
- Source: github.com/FAAMT/ROS_UGV_ULTRON

Technical Skills

Programming Languages
- VHDL
- SystemVerilog
- C/C++, ASM
- Python, MATLAB

Developer Tools
- Xilinx Vivado & Vitis
- Synopsys Design Compiler
- Siemens ModelSim
- GTKWave, GHDL

Software Frameworks
- ROS, Gazebo
- OpenCV, SciPy
- PyTorch, TensorFlow
- TVM, ONNX

Development Boards
- Zynq UltraScale+ RFSoCs
- Cyclone FPGA and SoCs
- Raspberry Pi, ESP32
- Arduino, ARM Cortex-M