Kyle Mitard

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EDUCATION: Worcester Polytechnic Institute (WPI), Worcester, MA
BS Electrical and Computer Engineering (ECE), 4.00 GPA — Dec 2023
PhD Electrical and Computer Engineering (ECE), 4.00 GPA — Dec 2028 (est.)
Relevant courses taken or taking*:*

Advanced Digital System Design with FPGAs, Real-Time Embedded Systems, Computer Architecture, Microelectronic Circuits I & II, Continuous Time System and Signal Analysis, Methodologies for System-Level Design and Modeling (ESL), CMOS Fundamentals, Analysis of Probabilistic Signals and Systems, Digital Signal Processing

SKILLS:
Hardware: Oscilloscopes, logic analyzers, VNAs, Laser Voltage Imaging (Hamamatsu PHEMOS-X), SMD Soldering
Software: FPGA design tools (Vivado, ModelSim), CLIs (PowerShell, Linux), version control (Git), Schematic Capture, PCB Layout (KiCad, Altium, Xpedition), MCAD (SolidWorks, Onshape), LaTeX, EM simulation (ANSYS HFSS), IC design and simulation (Cadence Virtuoso), real-time operating systems (TI-RTOS)
Programming Languages: Verilog, VHDL, C/C++, MATLAB/Octave, Python, Assembly (RISC-V)

RESEARCH EXPERIENCE:
WPI Vernam Lab: — Spring 2023 - present

- *2024-present - Draper Scholar*: Security Analysis of Integrated Circuits using Laser Voltage Probe Microscopy
- Designed an FPGA-based sensor to detect optical probing - doi.org/10.1145/3676536.3676822
- Discovered a security vulnerability via brownout on FPGAs - https://arxiv.org/abs/2504.11633
- Designed and assembled a custom helper PCB to collect data through I2C interface
- Major Qualifying Project: Vulnerability Analysis of security ICs against Laser Fault Injection
  - Used an AlphaNov IR laser to induce faults in the LUTs of a Xilinx Kintex-7 FPGA
  - 2023 ECE MQP provost award runner up, 2023 ECE MQP video contest winner

Worcester Polytechnic Institute & Dell: — Fall 2021

- Modeling PCB traces for differential pairs in ANSYS HFSS to study signal integrity

PROJECTS:
"Kyle's Maybe Electrical Emporium" YouTube Channel: — Spring 2020 - present

- https://www.youtube.com/channel/UCtGWKR7W_5xtZDwKDi8d-TQ
- A means of documenting personal and school projects in an entertaining manner

ECE 505 RISC-V CPU: — Fall 2023

- Designed a single-cycle RISC-V CPU in Vivado, implementing a subset of the RV32I instruction set
- Simulated the CPU on a Xilinx Artix-7 FPGA up to 35MHz, in excess of the 20MHz goal

RELEVANT WORK EXPERIENCE:
Student Tutor: WPI Electrical and Computer Engineering: Worcester, MA — Fall 2021 - Spring 2024

- Teaching Assistant for ECE 2010 Intro to Electrical and Computer Engineering
- Ran lab sessions, MATLAB help sessions, and graded lab reports and MATLAB problem sets
- Collaborated to design an AM modulator PCB for use in the lab assignments
- Voted by students to win 2023 outstanding ECE undergraduate tutor award

Hardware Engineering Intern: CommScope: Lowell, MA — Summer 2023

- Performed a design verification test (DVT) on fiber internet hardware, streamlined with Python
- Collaborated to design an adapter PCB to provide clearance between mainboard and daughtercard for probes while preserving 10G PON interfaces

Engineering Intern: Mevion Medical Systems: Littleton, MA — Summer 2021

- Automated a a Process to Measure Q-Factor of a cyclotron resonator with GNU Octave

ACTIVITIES/INTERESTS:

- **WPI Combat Robotics Club:** — Spring 2023 - present
  - Designed and built a 1-lb "plastic antweight" for internal club competitions
  - Competed at April 2024 NHRL and MassDestruction Resurgance Too with 3-lb "beetleweight"
    - https://wiki.nhrl.io/wiki/index.php?title=Who_cares%3F
  - Designed a custom controller scheme using a Wii remote and ELRS using an ESP32