

Garrett Kirsch

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EDUCATION

University of Pennsylvania, School of Engineering, Philadelphia, PA

May 2027

Relevant Courses: Computer Architecture, OS, Embedded Systems, Digital IC, Analog IC, Hardware-Software Codesign for ML

Candidate for BSE in Computer Engineering

Candidate for MSE in Electrical Engineering

Graduation Date: May 2027

GPA: 3.95

EXPERIENCE

CyberSavvy Lab | Research Assistant

May 2025 – present

- Setting up FPGAs as cloud resources; using Docker, Kubernetes, Proxmox, OKD, and QEMU.
- Creating CI pipeline for testing new designs and architectures using Gitea on a local cluster.

Microprocessor Performance Modeling | Researcher, Prof. Benjamin Lee

Jan 2025 – May 2025

- Researched chiplet-based and 3D microarchitectures, focusing on thermal and power analysis.

Pieces for Developers | Quality Assurance and Developer Relations Intern

May – August 2024

- Tested pre-release builds of the desktop app and browser extensions.
- Provided UX polish ahead of pricing rollout.

Penn Engineering | Teaching Assistant

August – December 2024

- Led recitations, office hours, grading, and review sessions. Covered C, RISC-V, digital logic, CMOS.

Penn College Houses | Residential Advisor

August 2024 – present

- Built community across 20 residents with diverse backgrounds; budgeted and executed programs.

Hamilton County Court, Dispute Resolution Dep. | Volunteer

May – July 2023

- Analyzed department revenue data used to secure increased funding; digitized over a decade of sensitive case files.

PROJECTS

RISCV Processor

- Wrote a 32-bit RISCV multistage, pipelined processor in System Verilog, tested with Verilator simulations.
- Implemented an AXI4-Lite cache from the official Arm specifications.

Penn Shell

- Worked in a team of 2 to design a shell to handle UNIX commands in C.
- Implemented pipelines, input/output redirection, job control, and signal forwarding.

Metal Detector

- Created a metal detector using two oscillators, a mixer, two CS Amps, and a CD Amp for the output voltage to a speaker.
- Designed the PCB using Altium Designer and soldered the components in lab.

Music to My Ears – An Embedded Systems Project

- Embedded music transposer on Atmega328PB in bare-metal C with visual display.
- Code written in bare-metal C, including PC and timing interrupts, UART, graphics, transposition algorithm, and PWM.

64-bit SRAM

- Designed an SRAM with a 1:1 aspect ratio using VLSI tools, including the necessary peripheral circuits such as tristate buffers, row and column decoders, bit-line prechargers, and registers to hold inputs and outputs.

LC-4 Assembler and Disassembler

- Designed an assembler and disassembler in C for the LC-4 single-cycle processor.

Personal Website – [Repo](#)

- Created a static website using Hugo to display my projects and passions.

SKILLS

Coding Languages: Bash/Shell scripting, System Verilog, CUDA, Java, JavaScript, OCaml, C, Assembly (RISCV), Python

Platforms/Tools: Docker, Kubernetes, Spice, Cadence, Git, GitHub, Linux, Latex, Arduino, Hugo, Altium.

Hardware: Proficient with analog and digital IC design, linear circuit design, soldering, bare-metal C, PCB layout.