

# Garrett Kirsch

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## EDUCATION

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University of Pennsylvania, School of Engineering, Philadelphia, PA

May 2027

Relevant Courses: Computer Architecture, Embedded Systems, Computer Systems, Data Structures and Algorithms

Bachelor of Science in Engineering

Major: Computer Engineering

Year: Junior

GPA: 3.95

## EXPERIENCE

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CyberSavvy Lab | *Research Assistant*

May 2025 – present

- Setting up FPGAs as cloud resources; using Docker, Kubernetes, Proxmox, OKD, QEMU VMs, and more.

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 – May 2025

- 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 highly sensitive case files.

## PROJECTS

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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.

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 to the PCB 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.

Web Scraping – [Link](#)

- Wrote a script that scrapes the top headlines of The Daily Pennsylvanian every day.

## SKILLS

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**Coding Languages:** Shell scripting, System Verilog, Java, JavaScript, OCaml, C, Assembly (Risc-V), Python, Kotlin

**Platforms/Tools:** Docker, Kubernetes, Spice, Electric VLSI, Git, GitHub, Excel, PowerPoint, Latex, Arduino, Hugo, Altium.

**Hardware:** Proficient with oscilloscopes, data extraction, circuit design, soldering, bare-metal C, PCB layout.