Sammy Hallacher

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Education

The Pennsylvania State University Expected May 2026
Bachelor of Science in Electrical Engineering, Minor in Jazz Performance GPA: 3.97/4.00

Relevant Coursework

Fundamentals of Digital Signal Processing ▪ Digital Image Processing ▪ Software Defined Radio ▪ Discrete-Time Linear Systems ▪ Continuous-Time Linear Systems ▪ Electronic Circuit Design I/II ▪ Computer Vision

Projects

Theremin Musical Instrument Design Project, Project Lead Spring 2025

- Designed and implemented a Class AB audio amplifier, delivering 20x signal amplification with distortion-free performance.
- Applied acoustic and RF principles to tune frequency response into the audible range for stable and high-quality audio output.
- Led a 4-person team, achieving full project completion one week before the deadline.

IEEE Audio Mixer Workshop Spring 2025

- Led a hands-on workshop guiding participants through soldering and assembling an audio mixer.

Baxandall Tone Control Circuit December 2023

- Prototyped tone control circuit on a breadboard using op amps, potentiometers, voltage dividers, and other components to create a circuit that manipulated audio signals.
- Utilized Multisim to create detailed circuit diagrams and performed tests to ensure functionality.

Experience

Product Development Engineering Intern at TE Connectivity, Middletown PA May 2025– August 2025

- Designed a 0-10V analog dimmer circuit to control motion-sensor LED streetlights, driving $45M in projected revenue over 10 years.
- Developed C firmware to interpret motion and light sensor data, achieving smooth PWM-based brightness control with 800 discrete levels compatible with industry-standard streetlights.
- Created a low-cost PCB in Altium Designer to be integrated on top of an existing motion-sensor product, resulting in a seamless prototype for 38¢ in components.

R&D Intern at Penn State Applied Research Laboratory, State College PA January 2024– August 2024

- Co-authored a journal publication in *Material Science and Semiconductor Processing,* contributing atomic force microscopy (AFM) and optical profilometry scans.
- Modeled replacement polishing components in SolidWorks and created 3D-printed prototypes used to make final stainless-steel parts.

Teaching Assistant for Circuits and Devices Course, Penn State August 2024 - December 2024

- Guided 24 students through weekly lab activities, achieving a 100% section pass rate.
- Debugged breadboards and solved power supply issues while reinforcing circuit fundamentals.

Leadership & Engagement

Leonhard Center Speaking Contest, Finalist January 2025

- Presented a ten-minute talk on acoustic metamaterials to an audience of 200 students.

IEEE Projects Committee, Officer Spring 2023 – Present

Penn State Premiere Jazz Band, Lead Alto Fall 2023 – Present

Technical Skills

Hardware: Microcontrollers (dsPIC, PIC16, ESP32), Arduino, Oscilloscope, Surface Mount Soldering
Design Tools: Altium Designer, KiCAD, LTspice, NI Multisim, NI LabVIEW, SolidWorks, SWD/JTAG Debugging
Signal Processing & Programming: Python, C/C++, MATLAB, GNU Radio