Sarah Cross

SCS Computational Biology Undergraduate at Carnegie Mellon University

Location Pittsburgh, PA, 15213 **Phone** (210) 350-8292

Email sarahcross@cmu.edu **GitHub** github.com/html1101

LinkedIn linkedin.com/in/sarah-cross-0740471b6

Website sarahcross.dev

EXPERIENCE

Software Engineering Intern — *PTZOptics, Downingtown, PA (Remote)* Jul 2021 - Present

- **Relevant Skills:** React, Rust, Python, NodeJS, Electron, Tauri, Express.JS, HTML/CSS/JS, Vite, TypeScript, NextJS, C++, Docker, GitHub CI/CD.
- **Web Interface** - Working in a team of 3 developers to design and create a robust web interface for PTZOptics IP cameras.
    - Features include clicking to center, advanced framing, live color correction using color pickers and video scopes, PTZ control, and live auto-tracking configuration-offering capabilities unmatched by any other PTZ camera interface currently on the market.
    - Product will be demoed live at ISE 2025 and released to beta users in March 2025.
- **Camera Management Platform (CMP)** - Developed and managed large desktop application to interface with IP cameras, offering advanced metrics such as auto-tracking, color correction, PTZ control, and multi-camera management.
    - Currently in beta, used in 400+ production setups ranging from churches to music production.
    - Demoed live at NAB 2023 (over 65,000 attendees), NAB NY 2022, CES 2022, and NAMM 2022.

      Website: https://ptzoptics.com/cmp.
- **TallyLights** - Worked in a team of 3 developers to create TallyLights controller software, integrating tally lights with IP cameras.
    - Provides a customizable setup for almost any production scenario, compatible with over 7 different video delivery solutions such as vMix, Wirecast, NDI, and OBS.

      Website: https://tallylights.com.
- **Microphone/Camera Integration** - Developing a platform for use by the BBC to integrate Yamaha Adecia beamforming microphones with PTZOptics IP cameras.
    - Product will be released in conjunction with the web interface in March 2025.

Independent Researcher — *Freelance, San Antonio, TX (Remote)* Dec 2019 - Present

- **Relevant Skills:** TensorFlow, PyTorch, Python
- Researched several topics relating to computational biology.
- Received first grand in Physical Sciences regionally in a fair of 500+ science fair projects (2021-2023) and advanced to state and international fair (ISEF finalist in 2021 and 2023).
- **OptoPulse AI** (TartanHacks ‘24) - An all-in-one AI platform designed to evaluate and analyze optometric information, such as elevated dry eye risk and basic vision tests. One of the top 15 projects at TartanHacks, the largest hackathon in Pittsburgh.
- **Single Cell Perturbation Analysis** (21-241 Final Project) - Analyzed single-cell drug-induced perturbations using linear algebra techniques.
- **Lupus Diagnosis** (ISEF ‘23) - AI model predicts lupus diagnosis using gene expression profiles with 99.13% testing accuracy.
- **MAS Mechanism Analysis** (02-251 Final Project) - Identified transcription factors (TFs) that bind locations associated with type II and III MAS (multiple autoimmune syndrome) diseases, then cross-referenced with corresponding gene expression levels to provide insight into understanding *why* these genes have modulated expression in those with MAS.
- **InflaTracker** (CAC ‘19) - Created an app to identify inflammatory foods for IBD patients; first place for Joaquin Castro’s district and nominated to present at the White House.

- **Transcription Factor Prediction** (ARASE ‘21) - Created an ML model to identify transcription factors given an arbitrary genetic sequence.

Volunteer — *San Antonio, TX* Nov 2019 - Present

- Introduced children ages 5-17 to coding through an interactive Robotics program.
- Running 2,167 kilometers in 2024 to raise funds for Inflammatory Bowel Disease (IBD) research.

Teacher’s Assistant — *MathCounts, San Antonio, TX* Nov 2019 - Feb 2020

- Teacher’s aid in summer STEM course for 5th and 6th graders; taught additional class to introduce students to programming using Python.

EDUCATION

Carnegie Mellon University — *BS in Computational Biology* Aug 2023 - Present

Pittsburgh, PA

- Enrolled in the School of Computer Science.
- Pursuing a concentration in Software Engineering.
- **Relevant Skills:** C, Julia, Java, Assembly, Python, C++, SML
- **Relevant classes:**
  - **Modern Biology** (03-121)
  - Matrices and Linear Transformations (21-241)
  - Principles of Imperative Computation (15-122)
  - Discrete Math (15-151)
  - **Great Ideas in Computational Biology** (02-251)
  - **Introduction to Modern Chemistry** (09-105)
  - **Introduction to Computer Systems** (15-213)
  - Remote Systems and the Cyber Domain in Conflict (84-387)
  - **Quantitative Cell and Molecular Biology Lab** (02-261)
  - Great Theoretical Ideas in Computer Science (15-251)
  - Principles of Functional Programming (15-150)
  - **Computational Biology Seminar** (02-402)
  - Introduction to Probability Theory (36-225)
- **Currently taking:**
  - **Introduction to Machine Learning** (10-315)
  - Writing for the Professions (76-270)
  - **Biochemistry I** (03-232)
  - **Foundations of Software Engineering** (17-313)
  - Intro to Rust Language (98-008)

Keystone School — *High School Diploma* Aug 2019 - May 2023

GPA: 4.0 San Antonio, TX

LANGUAGES

English - Native Proficiency

French - Limited Working Proficiency