Sam Belliveau

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EDUCATION

Cornell University — Ithaca, NY
Bachelor of Engineering in Electrical Computer Engineering — *Aug. 2023 – May 2026*

Hofstra University — Hempstead, NY
Bachelor of Engineering in Computer Engineering — *Aug. 2022 – May 2023*

Stuyvesant High School — New York, NY
Regents Diploma with Advanced Designation with Honors — *Sept. 2018 – Jun. 2022*

Related Courses: Discrete Structures Computer Science I-III, Introduction to Algorithms, Linear Algebra, Differential Equations, Data Science for Engineers, Signals & Systems

Related Courses: Discrete Structures Computer Science I - III, Digital Logic & Computer Organization, Differential Equations, Linear Algebra, Signals & Systems, Phyisics Mechanics, Data Science for Engineers, Electromagnetic Fields and Waves

Technical Skills

Languages: C, C++, C#, Python, Java, Rust, Swift, Go, JavaScript, Verilog HDL, SQL, HTML, GLSL, Bash / ZSH
Technologies: Git, Linux, Docker, VS Code, Robot OS (ROS), Cassandra, BigQuery, Numpy, Scipy, PyTorch

Languages: C, C++, C#, Python, Java, Rust, Swift, Go, JavaScript, Verilog HDL, SQL, HTML, GLSL, Bash / ZSH
Technologies: Git, Linux, Docker, VS Code, Robot OS (ROS), Cassandra, BigQuery, Numpy, Scipy, PyTorch, GenAI

Experience

Undergraduate Researcher June 2024 – Present
Abe Davis's Group @ Cornell University *Ithaca, NY*
- Rewrote 7,252 lines of code to build a well documented, expandable foundation for the ReCapture project in Swift
- Implemented a relational database allowing for the stoage and indexing of 20+ features over a large set of images

Robotics Software Engineer November 2023 – Present
Cornell University Autonomous Underwater Vehicles *Ithaca, NY*
- Reduced CPU usage by 80% by implementing Kalman Filtering using Nvidia's CUDA framework for linear algebra
- Improved submarine movement by implementing least squares optimization for determining thruster speeds

Signal Analysis Intern January 2023 – May 2023
Feinstein Institute for Medical Research *Manhasset, NY*
- Automated Sharp Wave Ripple (SWR) detection using Python and SciPy to analyze EEG data
- Researched SWRs, which help predict the onset of seizures, in order to improve the accuracy of the detection

Mechanical Engineer December 2022 - March 2023
ASME @ Hofstra University *Hempstead, NY*
- Led game and infrastructure development for school events and charities
- Headed various design projects at the behest of the school

VEX Robotics Coach / Mentor October 2022 – May 2023
PLAYIDEAs NY. *Great Neck, NY and Manhattan, NY*
- Coached 3 local VEX robotics of 6-8 students each, teaching them the basics of robotics and programming
- Developed lesson plans to teach students about PID control, Odometry, and very simple digital filtering

Software Intern on Consumer Product Team July 2022 – September 2022
Reddit Inc. *Remote*
- Worked with Taxonomy Group, which classified the safety of +138,000 subreddits on Reddit
- Developed a script that created realistic test data in order to verify the accuracy of the safety classification models
- Improved flagging of problematic content by adding statistics to the dashboard to find content that needed review

Software Intern on Consumer Product Team July 2021 – September 2021
Reddit Inc. *Remote*
- Created comprehensive unit tests to catch bugs before deploying to production
- Worked with tools such as BigQuery and Cassandra to send notifications reminding moderators to fill out surveys

President of Software Engineering December 2018 – June 2022
StuyPulse Robotics *Manhattan, NY*
- Led and taught team of $\tilde{5}0$ members to write software for a 120lb robot that competed in FRC Championships
- Implemented, taught, and documented PID control, Odometry, Digital Filtering, and Motion Profiling
- Communicated software design to competition judges and won 4 Innovation in Control Awards

PROJECTS

iOS Application: ReCapture | *Swift, SwiftUI, iOS, Json, OpenCV, Computer Vision* June 2024 – August 2024

- Rewrote ReCapture, an application that helps users take photos of subjects over time in order to create timelapses
- Implemented Computer Vision algorithms that indexed the metadata to automatically create unique visualizations

UCI Chess Engine in Rust | *Rust, Min Max, Alpha Beta Pruning, Chess* June 2023 – July 2023

- Developed a Chess Engine in Rust that achieved an Elo of 2700 (Grand Master level)
- Implemented Alpha Beta Pruning using high performance Rust to achieve a higher elo rating

Dolphin Emulator | *C++, GLSL, JIT Recompilation* September 2022 – Present

- Improved performance of emulation software by scaling frequency of video interrupt signals for low-end hardware
- Introduced 6 GPU accelerated resolution scaling algorithms to improve the image quality for all display resolution

GameBoy Emulator | *Rust, Z80 Assembly, Hardware Emulation* August 2021 – December 2021

- Implemented entire instruction set for the GameBoy's Z80 CPU using only publicly available documentation
- Developed rudimentary PPU (Pixel Processing Unit) to render sprites and tiles on the screen

StuyLib | *Java, JavaDocs, JitPack, Control Theory, Digital Filtering* January 2020 – August 2022

- Initiated and led the development of StuyLib, an award-winning Control Theory Library
- Heavily maintained and documented the library to ensure its longevity and ease of use