

# **Sam Belliveau**

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## EDUCATION

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<b>Cornell University</b>	Ithaca, NY
<i>Bachelor of Engineering in Electrical Computer Engineering</i>	Aug. 2023 – May 2026
<b>Hofstra University</b>	Hempstead, NY
<i>Bachelor of Engineering in Computer Engineering</i>	Aug. 2022 – May 2023
<b>Stuyvesant High School</b>	New York, NY
<i>Regents Diploma with Advanced Designation with Honors</i>	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, Physics Mechanics, Data Science for Engineers, Electromagnetic Fields and Waves

## TECHNICAL SKILLS

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**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

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<b>Undergraduate Researcher</b>	June 2024 – Present
<i>Abe Davis's Group @ Cornell University</i>	<i>Ithaca, NY</i>
<ul style="list-style-type: none"><li>• Rewrote 7,252 lines of code to build a well documented, expandable foundation for the ReCapture project in Swift</li><li>• Implemented a relational database allowing for the storage and indexing of 20+ features over a large set of images</li></ul>	
<b>Robotics Software Engineer</b>	November 2023 – Present
<i>Cornell University Autonomous Underwater Vehicles</i>	<i>Ithaca, NY</i>
<ul style="list-style-type: none"><li>• Reduced CPU usage by 80% by implementing Kalman Filtering using Nvidia's CUDA framework for linear algebra</li><li>• Improved submarine movement by implementing least squares optimization for determining thruster speeds</li></ul>	
<b>Signal Analysis Intern</b>	January 2023 – May 2023
<i>Feinstein Institute for Medical Research</i>	<i>Manhasset, NY</i>
<ul style="list-style-type: none"><li>• Automated Sharp Wave Ripple (SWR) detection using Python and SciPy to analyze EEG data</li><li>• Researched SWRs, which help predict the onset of seizures, in order to improve the accuracy of the detection</li></ul>	
<b>Mechanical Engineer</b>	December 2022 - March 2023
<i>ASME @ Hofstra University</i>	<i>Hempstead, NY</i>
<ul style="list-style-type: none"><li>• Led game and infrastructure development for school events and charities</li><li>• Headed various design projects at the behest of the school</li></ul>	
<b>VEX Robotics Coach / Mentor</b>	October 2022 – May 2023
<i>PLAYIDEAs NY.</i>	<i>Great Neck, NY and Manhattan, NY</i>
<ul style="list-style-type: none"><li>• Coached 3 local VEX robotics of 6-8 students each, teaching them the basics of robotics and programming</li><li>• Developed lesson plans to teach students about PID control, Odometry, and very simple digital filtering</li></ul>	
<b>Software Intern on Consumer Product Team</b>	July 2022 – September 2022
<i>Reddit Inc.</i>	<i>Remote</i>
<ul style="list-style-type: none"><li>• Worked with Taxonomy Group, which classified the safety of +138,000 subreddits on Reddit</li><li>• Developed a script that created realistic test data in order to verify the accuracy of the safety classification models</li><li>• Improved flagging of problematic content by adding statistics to the dashboard to find content that needed review</li></ul>	
<b>Software Intern on Consumer Product Team</b>	July 2021 – September 2021
<i>Reddit Inc.</i>	<i>Remote</i>
<ul style="list-style-type: none"><li>• Created comprehensive unit tests to catch bugs before deploying to production</li><li>• Worked with tools such as BigQuery and Cassandra to send notifications reminding moderators to fill out surveys</li></ul>	
<b>President of Software Engineering</b>	December 2018 – June 2022
<i>StuyPulse Robotics</i>	<i>Manhattan, NY</i>
<ul style="list-style-type: none"><li>• Led and taught team of ~50 members to write software for a 120lb robot that competed in FRC Championships</li><li>• Implemented, taught, and documented PID control, Odometry, Digital Filtering, and Motion Profiling</li><li>• Communicated software design to competition judges and won 4 Innovation in Control Awards</li></ul>	

## PROJECTS

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<b>iOS Application: ReCapture</b>   <i>Swift, SwiftUI, iOS, Json, OpenCV, Computer Vision</i>	June 2024 – August 2024
<ul style="list-style-type: none"><li>Rewrote ReCapture, an application that helps users take photos of subjects over time in order to create timelapses</li><li>Implemented Computer Vision algorithms that indexed the metadata to automatically create unique visualizations</li></ul>	
<b>UCI Chess Engine in Rust</b>   <i>Rust, Min Max, Alpha Beta Pruning, Chess</i>	June 2023 – July 2023
<ul style="list-style-type: none"><li>Developed a Chess Engine in Rust that achieved an Elo of 2700 (Grand Master level)</li><li>Implemented Alpha Beta Pruning using high performance Rust to achieve a higher elo rating</li></ul>	
<b>Dolphin Emulator</b>   <i>C++, GLSL, JIT Recompilation</i>	September 2022 – Present
<ul style="list-style-type: none"><li>Improved performance of emulation software by scaling frequency of video interrupt signals for low-end hardware</li><li>Introduced 6 GPU accelerated resolution scaling algorithms to improve the image quality for all display resolution</li></ul>	
<b>GameBoy Emulator</b>   <i>Rust, Z80 Assembly, Hardware Emulation</i>	August 2021 – December 2021
<ul style="list-style-type: none"><li>Implemented entire instruction set for the GameBoy's Z80 CPU using only publicly available documentation</li><li>Developed rudimentary PPU (Pixel Processing Unit) to render sprites and tiles on the screen</li></ul>	
<b>StuyLib</b>   <i>Java, JavaDocs, JitPack, Control Theory, Digital Filtering</i>	January 2020 – August 2022
<ul style="list-style-type: none"><li>Initiated and led the development of StuyLib, an award-winning Control Theory Library</li><li>Heavily maintained and documented the library to ensure its longevity and ease of use</li></ul>	