Joel Castro

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EDUCATION

UC Berkeley, College of Letters & Sciences **May 2026**

B.A. Computer Science Berkeley, CA

Scholarships: SEED Scholar, Jack Kent Cooke, CODE2040 Fellow, eBay Pathways Fellow, Cal Alumni Association Leadership Award

Relevant Coursework: Front End Technologies, Foundations of Data Science, Structure & Interpretation of Computer Programs, Data Structures and Algorithms, Information Devices and Systems, Multivariable Calculus, Discrete Math and Probability, Computer Architecture, Optimization Models, 3D Computer Modeling & Animation, Signals and Systems, Introduction to Robotics, Probability for Data Science, Computer Graphics and Imaging, Introduction to Machine Learning

SKILLS

Technical: Java, Python, C, C++, Arduino, Bash, ROS, Javascript, HTML, CSS, SQL, Git, Logisim, Unreal Engine, AutoDesk (Maya, Fusion, Inventor), Adobe Suite (Premiere Pro, Photoshop, After Effects, Substance Painter)

Languages: English (Native Proficiency), Spanish (Native Proficiency)

RELEVANT EXPERIENCE

REAL Labs, Stanford **March 2025 – August 2025**

Stanford SURF REU, Summer Research Intern Stanford, CA

- Designed a robotic handwriting task, including 3D-printed pen gripper and board hardware; validated setup with ARX5 action replay.
- Collected 450+ demonstrations and built evaluation pipeline leveraging Grounded-SAM2 and OpenCV for systematic benchmarking.
- Trained and deployed single- and multi-task Diffusion Policies for rollout on ARX5; established a goal-image-conditioned baseline with custom evaluation metrics to support future comparison with novel architectures.

Cardiac Vision Laboratory, UC San Francisco **September 2024 – January 2025**

Research Assistant San Francisco, CA

- Advanced 3D image processing methods to optimize visualization techniques for cardiac optical and ultrasound imaging data.
- Developed a Multi-View Camera Calibration and Visualization Tool: Automated the calibration process, eliminating the need for repeated manual execution and minimizing downtime.

Carnegie Mellon University Software and Societal Systems Department **May 2024 – August 2024**

REUSE SWE, Summer Intern Pittsburgh, PA

- Developed a type theory for enhancing diagramming tools and explored a type system for diagrams, leading to submissions and presentations at SPLASH and SACNAS conferences; achieved authorship in a subsequent first-author research publication.
- Categorically coded 150+ open-source visualization tools' source code (e.g., AMD GPUOpen, Torchview) for their data structure decomposition properties, yielding statistically significant evidence supporting our proposed diagram type theory.
- Collaborated with undergraduate peers, PhD candidates, and a CMU professor to design a human control experiment and eye-tracking study, to corroborate data observations and strengthen our theory's credibility.

Center for Computational Biology, UC Berkeley, Stellar Labs **August 2022 – May 2024**

Computational Biologist, Undergraduate Research Intern Berkeley, CA

- Performing Pandas, Matplotlib, and NumPy data visualization/analysis to determine protein traits that correlate with molecular binding.
- Exploring SHAP analysis on an in-lab convolutional neural network to increase its interpretability by determining which features it weighs greatest when predicting the presence of activation domains in protein.
- Streamlined all-atom Monte Carlo simulation pipeline of disordered proteins on the Savio computer cluster with Bash and Python scripting, leading to a time-saving increase of over 85% and wrote corresponding documentation used in the training of 2 peers.

PROJECTS

Minecraft Fabric Mod – CS184 Final Project Honorable Mention | Website **January 2025 – May 2025**

- Implemented procedural sphere generation, texture mapping, and quaternion-based rotation mechanics for physically accurate interactions.
- Contributed to shader enhancements, video production, and final deliverables, helping the project earn Honorable Mention in CS184.

Sockrates: Clothing color sorting/folding on 7-degree-of-freedom industrial robot arm | Website **August 2024 – December 2024**

- Led the development of Python/OpenCV categorization scripts, resulting in 100% classification accuracy.
- Built ROS Publisher/Subscriber System: integrated CV and precise robotic actuation implementing forward and inverse kinematics.

LEADERSHIP & VOLUNTEERING EXPERIENCE

(Berkeley) Anova **January 2023 – Present**

Onsite tutor; Publicity/Curriculum Committee Member Berkeley, CA

- Teach coding concepts in Python and Scratch to high school students weekly, enhancing their understanding of computer science.
- Developed and implemented Arduino curricula to improve tech accessibility for students in under-resourced communities.

61C (Computer Architecture) Course Staff **August 2024 – December 2024**

Tutor/Grader Berkeley, CA

- Support students by addressing an average of 30+ questions weekly during office hours on C, RISC-V, and Logisim concepts.
- Engage in weekly meetings to identify course content improvements and logistics, resulting in enhanced student learning outcomes.