

PATRICK R. PERRINE

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INTERESTS

Machine Learning, Artificial Intelligence, Computational Neuroscience

EDUCATION

California Polytechnic State University (Cal Poly), San Luis Obispo, CA

M.S. Computer Science with Distinction, 2023, GPA: 3.79.

Thesis: Neural Tabula Rasa: Foundations for Realistic Memories and Learning [5]

Advisor: Mugizi Robert Rwebangira, Ph.D.

San Diego State University (SDSU), San Diego, CA

B.S. Computer Science, 2020, GPA: 3.25.

Minor: Television, Film, and New Media.

Senior Project: High Quality Video Compression and Reconstruction [1].

RESEARCH EXPERIENCE

California Polytechnic State University

May 2021 - Current

- Developed a simulation of the Neuroidal model drawn from computational neuroscience in order to spark new developments in foundational methods in machine learning [5,7,8,9].
- Designed a Long Short-Term Memory network to predict human motion, which combined with a Generative Adversarial Network (GAN) to produce new images of such predicted motion [3,6].
- Wrote an essay on neural language processing to benefit accessible research methods [4].
- Leading a reasearch team of several graduate/undergraduate students and alumni.
- Directed two students' theses and five other senior project topics successfully.
- Supported five graduate students and six undergraduates to graduate when expected.
- Managing an NSF ACCESS grant and remote trials through the Pittsburgh Supercomputing Center.

San Diego State University

Feb 2019 - May 2020

- Implemented a GAN to compress video frames into substandard resolutions, and then upscale the lower-quality video frames to retain their original resolution and quality [1].
- Led a research group of graduate and undergraduate students to investigate the efficiency of the system.
- Compiled results into a paper that was accepted for oral presentation at SDSU's Student Research Symposium, which was the only one selected from Computer Science undergraduates.

Updated October 17, 2025

PUBLICATIONS AND PRESENTATIONS

9. Eben Sherwood, Patrick Perrine, Mugizi Rwebangira. Sequential Memory Generation in the Neuroidal Model. In *8th International Conference on Cognitive Computational Neuroscience*, August 2025. <https://2025.ccneuro.org/poster/?id=JlV7elX01B>
8. Ethan Wolfe, Patrick Perrine, Mugizi Rwebangira. Small-Worlds Memory Generation and Capacity in the Neuroidal Model. In *8th International Conference on Cognitive Computational Neuroscience*, August 2025. <https://2025.ccneuro.org/poster/?id=6kSD3R9WTW>
7. Patrick Perrine, Chandradeep Chowdhury, Mugizi Rwebangira. Capacity of the Neuroidal Model for Shared Memory Representations. In *7th International Conference on Cognitive Computational Neuroscience*, August 2024. <https://2024.ccneuro.org/poster/?id=585>
6. Patrick Perrine, Trevor Kirkby. KP-RNN: A Deep Learning Pipeline for Human Motion Prediction and Synthesis of Performance Art. In *7th International Conference on Artificial Intelligence and Virtual Reality*, July 2023. https://link.springer.com/chapter/10.1007/978-981-99-9018-4_24
5. Patrick Perrine. Neural Tabula Rasa: Foundations for Realistic Memories and Learning. California Polytechnic State University Research Affairs, Master's thesis, June 17, 2023. <https://digitalcommons.calpoly.edu/theses/2782>
4. Patrick Perrine. Inaccessible Neural Language Models Could Reinvigorate Linguistic Nativism. January 12, 2023. <https://arxiv.org/abs/2301.05272>
3. Patrick Perrine, Trevor Kirkby. Computational Choreography using Human Motion Synthesis. In *California State University Research Competition 2022*, April 29, 2022. <https://arxiv.org/abs/2210.04366>
2. Patrick Perrine. Publication Breakdown: Fair Generative Modeling with Weak Supervision. In *Data Science Seminar Lectures*, April 13, 2022. Cal Poly Data Science Initiative, San Luis Obispo, CA.
1. Patrick Perrine, et al. High Quality Video Compression and Reconstruction. In *Student Research Symposium*, February 29, 2020. San Diego State University Research Affairs, San Diego, CA. 200.

TEACHING EXPERIENCE

California Polytechnic State University

Teaching Associate Instructor, Discrete Structures

Jan 2023 - April 2023

- Taught a section of discrete mathematics consisting of over 30 students.
- Added a project-based component to the course curriculum.
- Revised all curriculum materials.

Instructional Student Assistant (ISA), Graduate Artificial Intelligence

Sept 2022 - Dec 2022

- Managed and evaluated four advanced Artificial Intelligence research projects.
- Lectured for three hours to give two publication breakdowns [3].
- Designed a quiz to test deep learning concepts.
- Graded over 100 lab and written assignments.

ISA, Computer Vision

Sept 2022 - Dec 2022

- Graded over 100 computer vision assignments in Python.

ISA, Introduction to Data Science Jan 2022 - March 2022

- Graded over 200 programming assignments in Jupyter Notebooks related to data processing, visualization, and analysis.

ISA, Knowledge Discovery from Data Jan 2022 - March 2022

- Tutored over 20 students in the theory and application of machine and statistical learning methods, with implementations in Jupyter Notebooks.

ISA, Computer Vision Sept 2021 - Dec 2021

- Graded over 100 assignments in Python, with some utilizing the TensorFlow and OpenCV frameworks.
- Held bi-weekly office hours to assist students with assignments.

ISA, Artificial Intelligence Sept 2021 - Dec 2021

- Graded over 70 Jupyter Notebook programming assignments.
- Graded over 70 written assignments regarding intelligence agent concepts.
- Graded over 10 final presentations on a variety of artificial intelligence projects.
- Designed a deep learning Jupyter Notebook assignment utilizing Chainer.

San Diego State University

ISA, Programming Languages Feb 2020 - May 2020

- Tested and graded over 200 programs written in Python, C, and C++.
- Helped to grade over 70 tests on programming concepts.
- Assisted students individually and in small groups.

ISA, Intermediate Computer Programming Feb 2019 - Aug 2019

- Tested and graded over 600 programs written in Java.
- Assisted students with assignments both in person and online.
- Designed a quiz on programming concepts and helped proctor an exam.

SERVICE EXPERIENCE

NeurIPS and ICML Communities

- Proposed and coordinated three social events to promote interdisciplinary collaboration at NeurIPS 2022, ICML 2022, and NeurIPS 2021, attracting over 200 unique conference participants.

California Polytechnic State University

Co-President, Computer Science and Artificial Intelligence Club May 2021 - Sept 2022

- Presented deep learning and artificial intelligence topics through publication breakdowns [2].
- Prepared agendas for weekly member meetings of 30-40 members and weekly meetings of six officers.
- Guided the succeeding executive board to promote academic growth in all areas of the club.

Graduate Student Representative, Graduate Studies Committee Sept 2021 - June 2022

- Attended quarterly meetings of the Graduate Coordinators of all Cal Poly graduate programs to address issues graduate students and administrators face.

Faculty Candidate Reviewer, Computer Science & Software Engineering Department Feb - March 2022

- Attended four research presentations and four teaching demonstrations from faculty candidates.
- Compiled careful feedback for the department on each candidate's performance and potential.
- Influenced the final decision of the department successfully to hire two specific candidates.

VP of Administration, Inter Housing Council Cerro Vista Sept 2021 - April 2022

- Coordinated with a team of five students to plan six community events for university housing residents.
- Proposed legislation to improve communication procedures with the campus-wide council successfully.
- Created agendas and minutes for weekly meetings of the community council.
- Managed the community council budget of \$1000.

San Diego State University

President, Artificial Intelligence Club Oct 2019 - May 2020

- Led an executive board effectively to create and present six workshops for instructing students to use Python and open-source datasets for Machine Learning studies.
- Fostered substantial growth in club membership from less than 10 members to over 30 members.
- Created over 12 flyers to promote guest researcher presentations.

Vice President of Community Service, College of Sciences Student Council May 2019 - May 2020

- Motivated 35 students to complete service resulting in over 200 hours served.
- Accounted for the number of service hours for each council member.
- Created a year-long calendar of local community service events.

Treasurer, Cyber Defense Team May 2019 - May 2020

- Protected a club budget of over \$10,000 in both physical and digital accounts.
- Coordinated with the executive board to responsibly spend hundreds of dollars on food, competition fees, and marketing materials for the club.
- Led a cyber security competition team of six that achieved the top 6% of nearly 1,000 teams in the National Cyber League competition.

Outreach Coordinator, Virtual Reality (VR) Club May 2019 - April 2020

- Marketed the club's three Unity VR projects to student body and faculty.
- Assisted in enlarging a club of six members to over a dozen.
- Applied interdisciplinary knowledge to a VR application for use in teaching an engineering course.

Faculty Candidate Reviewer, Computer Science Department Feb - March 2020

- Attended four doctoral dissertation presentations along with tenured faculty.
- Compiled opinions for the department on each candidate's potential to benefit the program.
- Influenced the final decision of the department successfully to hire a specific candidate.

Council Representative, University Affairs Board Nov 2019 - May 2020

- Helped to create a survey to gauge students' use of academic resources (tutoring, counseling, etc.) with the University Senate Chair and marketed survey which resulted in hundreds of student responses.

HONORS AND AWARDS

Graduate Assistant Fellowship, Computer Science, Cal Poly **July 2021**

Funded research, scholarship, and creative activities for Cal Poly's Computer Science M.S. Program.

Graduate Equity Fellowship, Graduate Education, Cal Poly **Jan 2023**

Demonstrated potential to succeed in and complete my M.S. program amidst financial hardship.

Graduate Assistant Fellowship, Graduate Education, Cal Poly **Sept 2021**

Funded assistance to the Dean of Graduate Education through planning academic development events.

100 Hours of Community Service Award, SDSU **May 2020**

Volunteered at local organizations such as the San Diego County Registrar of Voters and the Jacobs & Cushman San Diego Food Bank.

One Gallon Blood Donor, San Diego Blood Bank **March 2019**

Donated one gallon of blood/platelets to the San Diego Blood Bank which equates to 24 lives saved.

Membership, National Society of Leadership and Success **May 2018**

Challenged by a group of interdisciplinary undergraduates to set and accomplish realistic academic goals and be held accountable for their completion.

Membership, Golden Key Honors Society **Jan 2018**

Earned a GPA above the top 15% of San Diego State University's upperclassmen (23,000+ students).

Dean's List, SDSU **Dec 2017 - May 2020**

Maintained a 3.5+ GPA (4-point scale) across 12 graded units for Spring/Fall 2017 and Spring 2020.

PROFESSIONAL TRAINING

Mental Health First Aid Program, National Council for Mental Wellbeing **August 2023**

- Completed seven hours of training to provide initial help to adults experiencing a mental health issue.

Advancing Inclusive Mentoring (AIM) Program, Cal Poly **June - July 2023**

- Completed twelve hours of online training to foster inclusive and positive communication practices when mentoring undergraduate student research.

Grants Conference Participant, National Science Foundation (NSF) **June 2023**

- Attended four virtual conference sessions related to acquiring research funding from the NSF.

Pipeline to Grad School Bootcamp, UC Berkeley **May - June 2022**

- Participated in five online lectures on the Ph.D. application process.
- Developed a statement of purpose and personal statement according to program guidelines.
- Interacted with students in various Ph.D. programs to get their perspective on the process.

Safer Leadership Training, Cal Poly Safer **Sept - Nov 2021**

- Attended eight meetings to discuss issues related to technology abuse.
- Submitted a SMART goal and elevator pitch for Safer as a capstone project.
- Completed a discussion post submission for each meeting.

Positional Leadership Training, Cal Poly Center for Leadership**Oct 2021**

- Attended five meetings to discuss leadership theories and their applications.
- Presented a capstone project of three leadership case study reviews.
- Completed journal and application assignments for each meeting.

Leadership Certificate, SDSU Associated Students**Jan 2016 - May 2020**

- Participated in 12 leadership theory-related workshops and events.
- Created a survey for my student colleagues to anonymously critique my leadership style/effectiveness.
- Compiled reflection essays and experiential results into a capstone project that was reviewed and approved by the Dean of Students and other administrators.

SKILLS

Programming/Scripting Languages

Python, R, C/C++, Bash, MATLAB, C#, Java, Go, Lua

Software ToolsJupyter Notebooks, L^AT_EX, Git, NumPy, TensorFlow-Keras, OpenCV, Maya, Adobe Premier Pro

OTHER EXPERIENCE

Resident Advisor, Cal Poly University Housing

Sept 2022 - June 2023

- Responsible for the safety and development of over 35 student residents.
- Coordinated over a dozen community development activities and events.
- Promoted academic growth and encouraged graduate study to all residents.

Graduate Assistant, Cal Poly External Relations Student Affairs

Jan - June 2022

- Managed student data for over 5000 students participating in Spring Commencement.
- Developed a system to efficiently process various student data for regular maintenance.
- Organized over a terabyte of archival office data of up to 40 years of age into cloud storage.

Executive Board Member, Cal Poly Center for Service in Action (CSA)

Oct 2021 - Jan 2022

- Maintained connections with 100 local non-profits to match students with volunteer opportunities.
- Coordinated with 25 student organizations to promote local service activities.
- Processed several liability insurance and service partner agreement forms.

San Diego Registrar of Voters, Technical Inspector

Oct 2020 - Nov 2020

- Checked in over 150 local voters in the General Presidential Election of 2020.

Study Abroad Experience (Entrepreneurship), Rome, Italy

Dec 2019 - Jan 2020

- Helped simulate a start-up with a diverse team of four students.
- Designed a mobile health application to help users monitor their health habits, regulate the taking of prescriptions, and order over-the-counter medicine.

Sprouts Farmer's Market, Cashier/Courtesy Clerk

Aug 2016 - Aug 2018