

Bryan Vela

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Los Angeles, CA

Education

University of California, Irvine

Bachelor of Science in Computer Science

Latin Honors: Cum Laude | GPA: 3.93 / 4.00

Specialization: Artificial Intelligence and Machine Learning

Irvine, CA

Sep 2022 – Mar 2025

El Camino College

Associate of Science in: Mathematics, Physics, and Computer Science

Torrance, CA

Aug 2019 – Jun 2022

Relevant Coursework

Core Courses (Grades to the right)

- | | | | |
|---|------|--|-----|
| Machine Learning and Data Mining | [A] | Probabilistic and Deterministic Graphical Models | [A] |
| Neural Networks and Deep Learning | [A] | Causal Reasoning with Graphical Models | [A] |
| Deep Generative Models | [A] | Causal Inference for Reinforcement Learning | [A] |
| Probability for Computer Science | [A-] | Efficient Quantized Machine Learning Computing | [A] |
| Project in Deep Reinforcement Learning | [A+] | Introduction to Artificial Intelligence | [A] |
| Linear Algebra and Differential Equations | [A] | AI Frontiers: Technical, Ethical, and Societal | [A] |

Research Publications

C—Conference, J—Journal, R—In-Review, *—Equal Contribution

[R1] PoseBench3D: A Cross-Dataset Analysis Framework for Pose Estimation via Pose Lifting Networks

Saad Manzur*, Bryan Vela*, Brandon Vela*, Aditya Agrawal, Lan-Anh Dang-Vu, David Li, Wayne Hayes
Preprint. Under review at CVPR 2026. <https://arxiv.org/abs/2505.10888>.

[R2] UnrealPose: Leveraging Game Engine Kinematics for Large Scale Synthetic Human Pose Data

Joshua Kawaguchi, Saad Manzur, Emily Wang, Maitreyi Sinha, Bryan Vela, Yunxi Wang, Brandon Vela, Wayne Hayes
Under review at CVPR 2026.

Research Experience

Post-Baccalaureate Researcher in Machine Learning

Supervisors: Prof. Stephan Mandt and Dr. Felix Draxler

University of California, Irvine

Irvine, CA

Jul 2025 – Present

- Developing an autoregressive instance-segmentation and video-tracking system using a Transformer Neural Autoregressive Model (TNAM) from Transformers for Mixed-type Event Sequences (NeurIPS 2025), enabling sequential prediction of classes, bounding boxes, and ultimately masks from image features and point prompts
- Built toy datasets and the image-data pipeline; currently implementing bounding-box prediction with TNAM, followed by instance segmentation on images and subsequent extension to videos for multi-object tracking

Undergraduate Researcher in Machine Learning

Supervisors: Prof. Wayne Hayes and Dr. Saad Manzur

University of California, Irvine

Irvine, CA

Dec 2023 – Sep 2025

- Co-first authored PoseBench3D, a unified benchmarking framework for standardized cross-dataset evaluation of 3D human pose estimation models across H36M, 3DPW, GPA, and Surreal datasets promoting real-world generalization
- Co-authored UnrealPose, a synthetic dataset built in Unreal Engine 5, and integrated it into the PoseBench3D framework, ensuring cross-model compatibility and conducting benchmark comparisons with other synthetic datasets
- Re-implemented and re-evaluated 19 prior methods under controlled settings, reporting over 100 new cross-dataset generalization results using MPJPE and PA-MPJPE metrics, with analysis of data preprocessing impacts
- Analyzed synthetic and in-the-wild datasets in pose estimation studies to evaluate the impact of ordinal depth and occlusion on accuracy metrics such as MPJPE, PA-MPJPE, and PCK3D, under varied and occluded conditions

Undergraduate Researcher in Graph Theory

Supervisor: Prof. Wayne Hayes

University of California, Irvine

Irvine, CA

Jul 2023 – Dec 2023

- Developed a program utilizing to compute connected components, strongly connected components, degrees, and histograms for large directed and undirected graphs of PPIs (protein-protein interaction networks)
- Implemented dynamic construction of the canon-map lookup table in the BLANT codebase (Basic Local Alignment Network Tool) for efficient memory usage long-term compared to a full, static lookup table of graphettes of size $k > 9$
- Fixed existing bugs, memory leaks, and debugged the extensive BLANT codebase with Valgrind and GDB

NASA Community College Aerospace Scholar

National Aeronautics and Space Administration

Pasadena, CA

Jan 2021 – Sep 2021

- Conducted research on failed NASA missions involving In-Situ Resource Utilization (ISRU) capabilities and the Moon to Mars program, proposed the use of graphene in future designs for a wide range of equipment and tools
- Researched the development of state-of-the-art diagnostic equipment designed to monitor astronaut health in real-time and improve the efficiency and sustainability of systems technology aboard next-generation spacecraft
- Demonstrated advanced knowledge of NASA's past, current, and future missions by suggesting material changes to failed parts of operations and collaborating with NASA scientists and educators from various national sites

Teaching Experience

Course Learning Assistant — Ed Discussion & Discord Support

University of California, Irvine

Irvine, CA

Sep 2023 – Dec 2024

- Provided peer support via Ed Discussion and Discord (course messaging platforms) for the following upper-division courses: CS178 (Machine Learning and Data Mining), CS177 (Probability for Computer Science), CS171 (Introduction to AI), CS175 (Project in Deep Reinforcement Learning), and CS179 (Probabilistic and Deterministic Graphical Models)
- Consistently answered ~5 student questions per-course every weekday over 10-week quarters across multiple course offerings (more questions answered during midterm and finals season), demonstrated initiative and support in successfully explaining ML and AI concepts to other students
- Recognized by instructors during office-hours for helpfulness and support, including in-person thanks and public acknowledgments on course forums and from other students in class

Peer Tutor — Computer Science & Mathematics

El Camino College Math Study Center

Torrance, CA

Sep 2021 – Jun 2022

- Specialized primarily in tutoring students in introductory data structures/algorithms, multi-variable calculus, and discrete mathematics; improved student comprehension of recursive algorithms and proof techniques
- Created study guides and led group study sessions to prepare for midterms and finals, both in-person and on zoom

Honors & Awards

Jack Kent Cooke Scholarship

Jack Kent Cooke Foundation

- Nationally awarded scholarship totaling **\$165,000** for academic excellence and leadership

University of California, Irvine — Latin Honors: Cum Laude

University of California, Irvine — Phi Beta Kappa Honor Society Scholar

Edison International — Edison Scholars Scholarship for STEM

Robert Sprague Foundation — Robert Sprague STEM Scholarship

Extracurriculars & Leadership

University of California, Irvine — ACM Technical Interview Preparation Mentor

University of California, Irvine — HackUCI Hackathon Technical Peer Mentor

University of California, Irvine — Artificial Intelligence Club Member

Massachusetts Institute of Technology — HackMIT Hackathon Blueprint Judge

Massachusetts Institute of Technology — HackMIT Hackathon Participant

Jack Kent Cooke Foundation — Peer Mentor

Technical Skills

Programming Languages: Python, C++, C, Java, Bash, LaTeX

Libraries/Frameworks: PyTorch, PyTorch Lightning, NumPy, Scikit-Learn, Pandas, Matplotlib, Jupyter, OpenCV

Tools/Platforms: Git, Linux/Unix, UV, Conda, Slurm, High Performance Clusters (HPC), VS Code, GitHub, Google Colab