ANDERSON COMPALAS

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Education

University of California, Santa Cruz | **October 2020 − June 2025**
Bachelor of Science in Applied Mathematics with Minor in Computer Science | *Santa Cruz, California*

University of California, San Diego | **September 2025 − June 2027**
Master of Science in Electrical and Computer Engineering | *La Jolla, California*

Work Experience

CSE 142 Machine Learning Tutor | **April 2024 − June 2024**
University of Santa Cruz | *Santa Cruz, CA*
- Provided academic support as a tutor for over 50 students in an upper-division machine learning course at UCSC
- Engaged with students on the discussion board, addressing queries and facilitating discussions providing responses within 1 hour.
- Conducted 1 hour long office hours to mentor students in understanding machine learning concepts such as linear/logistic classification, regression, decision trees, perceptron, ensemble learning(boosting) etc. over the course of 10 weeks.

CSE 144 Deep Learning Reader/Grader | **September 2024 − December 2024**
University of Santa Cruz | *Santa Cruz, CA*
- Responsible for grading assignments and exams for over 100 students at an upper-division deep learning course at UCSC
- Assisted students by answering questions related to grading criteria and deep learning concepts
- Covered foundational deep learning topics including regression, classification, gradient descent, optimizers, feedforward, convolutional, and recurrent neural networks, and transformers over the course of 10 weeks.

Research

Undergraduate Researcher, ERIC Lab | **June 2024 − Present**
University of California, Santa Cruz | *Santa Cruz, CA*
- Researching at the UCSC Embodied and Responsible Interaction and Communication (ERIC) Lab, with a focus on embodied agents and multimodal machine learning   .
- Co-authored the paper *Multimodal Situational Safety* paper (**NeurIPS**, **ICLR**); contributed to **MSSBench**, evaluating over 1,000 real-world situational images.
- Actively contributing to ongoing projects and high-tier conference submissions (e.g., NAACL, NeurIPS, ICLR).

Undergraduate Researcher, HARE Lab | **September 2025 − Present**
University of California, Santa Cruz | *Santa Cruz, CA*
- Developing autonomous quadruped locomotion on the Unitree B1 robot using reinforcement learning in **NVIDIA Isaac Sim/Lab**.
- Training policies using **PPO** on the Nautilus supercluster and managing distributed simulation with **Kubernetes**.
- Focusing on tasks for sim-2-real deployment into agricultural settings with uneven terrain.

Projects

NBA Winner Prediction Tool | *PyTorch, JavaScript, CSS* | **December 2023**
- Built a neural network in PyTorch trained on 17,000 NBA games to predict match outcomes with 67% accuracy.
- Developed and demoed a mock web interface to visualize predictions using JavaScript and CSS.
- Presented to judges and peers; won **1st place** at UCSC's Santa Cruz AI Club quarterly competition.

Kaggle CIFAR-100 Transfer Learning Competition | *PyTorch, torchvision* | **January 2024**
- Achieved 15th place in image classification competition on Kaggle which tasked participants to perform classification on a dataset with 100 classes with only 1000 images each.
- Developed an image classification model based on pretrained torchvision EfficientNet models with transfer learning, data augmentation, and regularization/optimization techniques.
- Applied aggressive data augmentation with using `torchvision`'s `AutoAugment` and tuned model with progressive layer unfreezing, learning rate schedulers, dropout, weight decay, etc.

Fixed-Wing UAV Flight Simulator | *Python, Pygame, Control Theory, State Estimation* | **March 2025**
- Developed control and physics modules for a full 6-DOF fixed-wing UAV simulator in `pygame`, modeling 12-state dynamics, aerodynamic forces, and closed-loop control.
- Simulated stochastic wind disturbances via Dryden turbulence and Gauss-Markov processes, with realistic IMU, GPS, and barometric sensor noise.
- Designed complementary filters and PID/PI/PD controllers for attitude, altitude, and course control, and experimented with discrete state-space estimation to improve course and wind angle inference.

State Estimation of Lorenz-96 System with Echo State Networks and Ensemble Kalman Filter | *Python* | **June 2025**
- Trained a pure Echo State Network (ESN) on the Lorenz-96 system, achieving valid times comparable to published results.
- Found that ESN-EnKF performed well with frequent noisy observations, but failed under temporal sparsity, unlike physics-based models which corrected effectively at longer intervals.

Technical Skills

Programming Languages: Python, C, C++, R, SQL, MATLAB, Tableau, LaTeX
Libraries/Frameworks: Pytorch, Tensorflow, Keras, Scikitlearn, Nvidia Lab, Kubernetes, Docker