**ADRIAN ZHU CHOU**

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**EDUCATION**

**UNIVERSITY OF CALIFORNIA SAN DIEGO**

**Bachelor of Science in Cognitive Science with Specialization in Machine Learning and Neural Computation**

* Expected Graduation: June 2025
* GPA: 3.62

**PROJECTS**

[**Comparative Study of MCTS, Q-Learning & SARSA in Chess**](https://github.com/AdrianZC/PROJECTS/tree/main/COGS%20188%20Project) **-** Lead Developer, 3-person team (COGS 188, UC San Diego)

* Built a Gym-compatible chess environment, coded MCTS, tabular Q-Learning and SARSA agents, and wrote a dataset generator for balanced start-positions.
* Scripted grid-search training runs, logged rewards and win/draw/loss stats, and staged round-robin tournaments against heuristic baselines to benchmark algorithm performance.
* Tuned hyperparameters that pushed MCTS to a 62% win rate while Q-Learning offered the best compute-efficiency trade-off, guiding recommendations for future hybrid approaches.

[**Convolutional Neural Networks for Image Classification on CIFAR-10 and Tiny ImageNet**](https://github.com/AdrianZC/PROJECTS/tree/main/COGS%20181%20Project) **-** Lead Developer, 2-person team (COGS 181, UC San Diego)

* Implemented and evaluated multiple CNN architectures (Simple CNN and ResNet18) using PyTorch, achieving 81.28% accuracy on the CIFAR-10 dataset through systematic hyperparameter tuning.
* Designed comprehensive experiments with 52 different configurations to analyze the impact of optimizer choice, learning rates, regularization techniques and data augmentation strategies.
* Created extensive visualization tools that quantified performance trade-offs between architectures, demonstrating that properly tuned simpler models could achieve competitive results with lower computational requirements.

[**Predictive Analytics on Diabetes Risk & Pregnancies**](https://github.com/AdrianZC/PROJECTS/tree/main/COGS%20108%20Project)- Project Manager, 5-person team (COGS 108, UC San Diego)

* Conducted a predictive analysis to examine the correlation between pregnancy and Type-II diabetes among Pima Indian women.
* Cleaned and preprocessed data using Python libraries (pandas, NumPy) and developed predictive models (logistic regression, SVM), to identify correlations.
* Created visualizations with matplotlib to communicate trends, leading to potential health policy insights. Improved model accuracy through iterative tuning and feature selection, effectively highlighting trends relevant to medical interventions.

[**Comprehensive Comparison of Generative Models: DC-GAN, WGAN-GP and VAE**](https://github.com/AdrianZC/PROJECTS/tree/main/COGS%20185%20Project) -Lead Developer (COGS 185, UC San Diego)

* Conducted a systematic comparison of three generative models using PyTorch on CIFAR-10 and MNIST datasets, focusing on trade-offs between image quality, training stability and computational efficiency.
* Designed and implemented DC-GAN, WGAN-GP and VAE architectures from scratch, conducted rigorous experiments across six hyperparameter configurations and evaluated performance using FIC, Inception Score and diversity metrics.
* Demonstrated that WGAN-GP achieved the best image quality, DC-GAN offered the best quality-speed tradeoff and VAE enabled the fastest training, leading to actionable recommendations supported by statistically validated experiments.