Adrian Wong

Los Angeles, CA | (714) 272-5703 | adrianskw@gmail.com | LinkedIn | GitHub | Personal Webpage

SUMMARY

Research Scientist at the Air Force Research Laboratory experienced in addressing real-world problems, with proven ability to communicate complex technical concepts to diverse stakeholders. Physics PhD from UC San Diego with multiple graduate-level internships, providing a strong computational background specialized in data assimilation and scientific machine learning. Driven by curiosity, committed to high standards, and always eager to acquire and apply new skills efficiently.

EDUCATION

University of California San Diego, *Ph.D. Physics* 2022
- *Thesis: Predictions of Chaotic Systems with Physical Models and Machine Learning*
- *Advisor: Henry Abarbanel*

University of California San Diego, *B.S. Physics* 2014

WORK EXPERIENCE

Air Force Research Laboratory: Edwards AFB, CA 2021 – *Present*
Research Scientist
- Conducted research addressing complex scientific and technical challenges supporting national priorities
- Engaged with academic researchers to assess technical merits and relevance of emerging technologies to existing projects
- Authored successful grant proposals, serving as technical lead and liaison with funders/stakeholders
- Directed summer internship projects and provided guidance to interns

University of California San Diego: La Jolla, CA 2015 – 2022
Research Assistant
- Proposed and developed novel model-based methods for data assimilation of chaotic systems
- Evaluated and applied recurrent neural networks to predict chaotic systems, leveraging nonlinear dynamics

Teaching Associate and Lead Teaching Assistant
- Designed brand new curriculum for an online introductory physics course for 120+ students
- Managed overall class structure for 300+ students, including up to 8 Junior Teaching Assistants
- Taught lower-division, upper-division, and advanced graduate-level classes

San Diego Supercomputer Center: La Jolla, CA Spring 2017
Intern (High Performance Geo-Computing Group)
- Enforced data locality and minimize cache misses in peta-FLOP finite difference geophysics code

Lawrence Livermore National Laboratory: Livermore, CA
Intern (High-Energy Density Physics Division) Summer 2017
- Parallelized Monte Carlo radiation transport simulation

Intern (Equation of State and Materials Theory Group) Summer 2016
- Proposed and developed a convexity-enforcing algorithm to repair 'unphysical' regions of data

SKILLS & CERTIFICATIONS

- Languages: C/C++, MATLAB, Python
- Python Libraries: numpy, scipy, pandas, matplotlib, pytorch, sklearn
- Quantitative: data assimilation, state estimation, RNN, PCA, ICA, information theory, statistics and probability
- Certifications: Erdős Institute Deep Learning Boot Camp, Upstart - AI in Financial Services

SELECT PROJECTS

Team 12: Fraud Detection with Deep Learning (1st place project, PyTorch, ScitKit-Learn) Summer 2025
- Attempting unsupervised detection in a large fraudulent credit card transactions dataset (roughly 600k entries and 400 features) using autoencoders. Results beat baseline isolation forest and Gaussian Mixture Model in recall, precision, and ROC AUC at the cost of additional computation. Implementation of user identification allowed for detecting unique users, which is used for characterization of fraudulent users by some 'average' of their transactions. Autoencoder precision was notably higher (34%) compared to the best baseline (20%), whereas ROC AUC and recall were only slightly better than the baseline (0.81 AUC and 72% recall for autoencoders, 0.77 AUC and 67% recall for baseline). [GitHub] [Slides]

AlexNet from Pre-trained Weights Spring 2017
- Reproduced the inference architecture of AlexNet, a convolutional image classifier, from scratch (in C++) using pretrained weights with an emphasis on efficient computation. Fully utilizing OpenMP vectorization, each image took less than 20ms to process on a laptop CPU.

PUBLICATIONS

- **Adrian Wong**, Robert Martin, and Daniel Eckhardt. Contraction and synchronization in reservoir systems. *Physical Review E*, 2024
- **Adrian Wong**, Christine Greve, and Daniel Eckhardt. Time-resolved data-driven surrogates of hall-effect thrusters. *Journal of Electric Propulsion (in review),* 2024.
- Robert Martin, Christine Greve, Cesar Huerta, **Adrian Wong**, Justin Koo, and Daniel Eckhardt. A robust time-delay selection criterion applied to convergent cross mapping. *Chaos: An Interdisciplinary Journal of Nonlinear Science, 34(9),* 2024.
- Cesar Huerta, Christine Greve, and **Adrian Wong**. Comparison of causality determination techniques in studying hall-effect thrusters. *Journal of Electric Propulsion, 3(1):23*, 2024.
- Alex Tong Lin, **Adrian Wong**, Robert Martin, Stanley J Osher, and Daniel Eckhardt. Parameter inference of time series by delay embeddings and learning differentiable operators. *arXiv preprint arXiv:2203.06269,* 2022.
- Jason Platt, **Adrian Wong**, Randall Clark, Stephen G Penny, and Henry DI Abarbanel. Robust forecasting using predictive generalized synchronization in reservoir computing. *Chaos: An Interdisciplinary Journal of Nonlinear Science, 31(12),* 2021.
- **Adrian Wong***, Zheng Fang*, Kangbo Hao*, Alexander JA Ty, and Henry DI Abarbanel. Precision annealing monte carlo methods for statistical data assimilation and machine learning. *Physical Review Research, 2(1):013050*, 2020.
  (*shared first authorship)

PRESENTATIONS

- AFOSR Dynamical Systems and Control Theory Program Review (2022, 2023, 2024)
- AFOSR Dynamic Data and Information Processing Program Review (2023, 2024)
- International Electric Propulsion Conference - **Best Paper Award** (2024)
- Joint AFOSR and ARO Workshop, Data-driven Causal Inference (2024)
  (AFOSR = Air Force Office of Scientific Research, ARO = Army Research Laboratory)