

Adrian S. Wong

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Education

University of California, San Diego:

- PhD, *Physics with specialization in Computational Science* Sept 2015 — Current
- BS, *Physics with specialization in Computational Physics* Sept 2010 — June 2014

Research Experience

University of California, San Diego:

Graduate Researcher - Physics Department, Abarbanel Group Sept 2017 — Current

- [Precision Annealing Monte Carlo](#) - Proposed and developed novel model-based methods for accelerated but reliable data assimilation of chaotic physical systems. (C++/Python)
- Reservoir Computing - Examining the theoretical underpinnings of model-free predictions of chaotic physical systems and its efficacy using the principles of nonlinear dynamics and synchronization. (C++/Python)
- Biologically Realistic Machine Learning - Exploring classification problems using a realistic olfactory system as the architecture of a Spiking Neural Network (C++/Python)

Lawrence Livermore National Laboratory:

High Energy Physics Intern ([Iterative Implicit Monte Carlo](#) Code) Summer 2017

- Parallelized an industry-level radiation transport code that uses Monte Carlo simulations (C++/MPI)
- Computation Intern ([Equations of State and Materials Theory Group](#))* Summer 2016
- Proposed and developed a convexity-enforcing algorithm to repair 'un-physical' regions of data (Python/C++)
 - Contributed to an open-sourced polynomial fit library by adding options for different numerical-derivatives (C++)

San Diego Supercomputer Center:

High Performance Computing Intern ([High Performance Geo-Computing Group](#)) Spring 2017

- Arranged data structures for a peta-FLOP Finite Difference code, targeting the Intel Xeon Phi architecture
- Strongly enforced data locality such that cache-misses are minimal (C++/OpenMP)

Other Experience

University of California, San Diego:

Teaching Associate (Physics Department) Summer 2020

- Designed curricula for an introductory but intensive physics class for 200 students.
- Adapted quickly to COVID-19 related changes to education, specifically the online-only class structure.
- Experimented with non-traditional and modern teaching approaches to teaching physics with students' praise.

Teaching Assistant (Physics Department, Mathematics Department) Sept 2015 — Present

- Taught in lower division, upper division, and even advanced graduate level classes.
- Lead up to 8 junior teaching assistants and organized class activities.
- Developed adaptive strategies with the lecturer that help maximize the students learning potential.

Miscellaneous Projects

Deep Learning Image Classification with AlexNet (Team, C/C++, OpenMP): June 2017

- Rebuilt the convolutional neural network AlexNet [from scratch](#) with a HPC-aware code architecture
- Using pre-trained weights, achieved classification times around 10ms per image (129-by-129 pixels) on CPU

EM Modes in Waveguides (MATLAB): June 2016

- Implemented both Finite Element and Finite Difference methods to solve Maxwell's Equations in 2D
- Calculated TE & TM modes numerically to determine and validate their respective cutoff frequencies

Inverted Pendulum with Oscillating Pivot (MATLAB): March 2016

- Modelled an idealized pendulum and designed numerical experiments to find the transition points
- Investigated/characterized the bifurcations and phase-portraits of the inverted oscillation modes

Monte Carlo Simulation of Non-Ideal Gases (Team, C/C++, OpenACC): June 2014

- Simulated and characterized the steady-state distributions of a fluid using Monte Carlo Markov Chains

Simulation of the Mice Galaxies' Collision (Team, C/C++, OpenACC): March 2014

- Wrote and parallelized our own n-body integrator for gravity with softening parameter to run our simulations