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 methods for data assimilation of chaotic systems that aim to overcome memory limitations. Paper pending; manuscript submitted to the journal NPG
- Biologically Realistic Machine Learning - attempting to perform simple image classification 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) — June 2017 — Sept 2017

- Parallelized a research-level radiation transport code that uses Monte Carlo simulations (C++/MPI)

Computation Intern (EOS and Materials Theory Group) — June 2016 — Sept 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 (HPGeoC Group) — March 2017 — June 2017

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

Other Experience

University of California, San Diego:

Lead Teaching Assistant (Physics Dept, Math Dept) — Sept 2015 — Present

- Organizing lecture classes' structure, writing exams, and overseeing (up to 8) junior teaching assistants
- Develop strategies with lecturers that help maximize the students learning potential

Cambridge Learning Center

Tutor and Assistant Manager — Oct 2014 – Sept 2015

- Tutored at an after-school program for K-through-12 and helped students develop good learning habits
- Made sure that all tutors had a balanced workload, and that their students are staying on task

Class 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

Technical Skills

- Familiarity with UNIX environment, makefiles, C/C++ practices, git repositories, and test scripts
- Languages and Technologies: C/C++, MATLAB, Python, Mathematica, CUDA, OpenACC, OpenMP, MPI