Hong Suh

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https://hongsuh7.github.io ◇ https://github.com/hongsuh7

SKILLS

Programming: Python, R, SQL, Mathematica, LaTeX, Java
Tools/Packages: PyTorch, scikit-learn, NumPy, CuPy, Pandas, tidyverse, Plotly
Theory: Deep Learning, Machine Learning, Probability, Numerical Differential Equations, Data Structures, Algorithms

SELECT PROJECTS

◇ *Tennis win prediction model.*

- Designed and implemented a prediction model for professional tennis player matchups using **Pandas, NumPy**.
- Eliminated human supervision by automating hyperparameter selection using GPU optimization with **CuPy**.
- Decreased log-loss error by about **1.5%** compared to FiveThirtyEight's model.
- Created interactive graphics for users to experiment with predictions using **Plotly**.

◇ *Neural network model for image classification and generation.*

- Developed a new normalizing flow architecture using masked convolutions and a modified **neural ODE (NODE)** model for image generation using **PyTorch**.
- Conducted rigorous statistical tests on my modified NODE classifier model with **adversarial training** to demonstrate its training speed-up and similar adversarial robustness compared to the vanilla NODE model.

◇ *PhD research on stochastic homogenization for an exclusion process.*

- Established **previously unresolved quantitative bounds** on the long-term statistics of a stochastic growth model, which is a class of models encompassing infection disease growth, forest fires, crystal growth, and more.

◇ *Undergraduate research on fringe pairs in generalized MSTD sets.*

- Developed new algorithm to construct generalized MSTD sets, which are special integer sets, using **Mathematica**.
- Discovered the **most "extreme" MSTD set** known at the time using the algorithm.

EXPERIENCE

Math Teacher (grades 6-12) June 2019 – June 2020
Proof School, San Francisco, CA

◇ Created and executed daily 2-hour lesson plans for 8 to 16 students covering advanced math subjects—such as university-level linear algebra, number theory, and discrete probability—to kids who love math.

◇ Created and supervised mathematical programming projects involving fast matrix multiplication, singular value decomposition, pseudorandom number generators, and more.

Graduate Student Instructor (GSI) and Researcher August 2016 – May 2019
UC Berkeley, Berkeley, CA

◇ Executed lectures and discussions as a GSI or primary lecturer to 20-50 undergraduate students in single-variable calculus, multivariable calculus, and linear algebra.

◇ Conducted theoretical research, presented at three seminars, and published one paper.

EDUCATION AND AWARDS

Ph.D, Mathematics on leave
Specializations: Probability, PDEs
UC Berkeley, Berkeley, CA

M.A, Mathematics 2019
Specializations: Probability, PDEs
UC Berkeley, Berkeley, CA

B.A, Mathematics, cum laude 2016
GPA: 3.89
Pomona College, Claremont, CA

◇ NSF Graduate Research Fellowship Honorable Mention 2016

◇ 3 Pomona College Mathematics Department Prizes 2014, 2015, 2016