DANIEL GUO

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EDUCATION

University of California Santa Barbara September 2018 - June 2022
B.S. in Computer Science, B.S. in Mathematics GPA: 3.90/4.00
College of Creative Studies | Honors

RESEARCH EXPERIENCE

Data-Driven Learning of Differential Operators Nov. 2018 - Present
U.G. Researcher under Dr. Atzberger (Dep. of Mathematics at UCSB)

- We are building neural networks to learn differential operators from data. We have achieved success in learning kernel representations of the Laplacian operator in 2 dimensions through its finite difference kernel and Green's function by using CNNs. We hope to extend this to higher dimensions and more general PDEs.
- Gave talk at 2019 RACA conference on this work.

TECHNICAL STRENGTHS

Languages	Python, C++, Java, C, LaTeX
Libraries	PyTorch, NumPy, Matplotlib, Flask, Java AWT & Swing, OpenMP & Pthreads
Technologies	Git, Linux, Vim, Jupyter Notebook

PROGRAMMING PROJECTS

hiwhatsyourname - Flask Web App

- Project for CalHacks 2020 intended to help college students living in the dorms get to know each other.
- Users fill out an online form with their personal info, and it generates a virtual business card that they can easily share with a QR code.
- We implemented the backend with Python Flask & Jinja to process requests and generate the business cards, and we used the qrcode API to create the QR code.

talkie - Post-Quantum Public Key Encryption Scheme

- Implemented Regev's PKE scheme based on the Learning with Errors problem, which is (supposedly) secure against quantum attacks.
- Used C sockets with TCP protocol to simulate sending messages between clients and a server.

GenNet - Genetic Algorithm + Neural Networks

- Designed architecture & hyperparameter search for neural networks using a genetic algorithm w/ PyTorch.
- Applied algorithm on MNIST dataset and achieved 96.6% classification accuracy with a minute of training.

RELEVANT COURSEWORK

Computer Science
Algorithms, Data Structures
Machine Learning
Computer Architecture
Compilers
Parallel Scientific Computing

Mathematics
Linear Algebra
Abstract Algebra
Real Analysis
Topology
Combinatorics

Automata & Formal Languages
Blockchain & Distributed Ledges
Distributed Systems
Computer Programming & Organization
Post-Quantum Cryptography (Gradudate)
Logic in Computer Science (Gradudate)
Multivariable Calculus
Differential Equations
Probability & Statistics
Discrete Math

OTHER EXPERIENCE

Teaching Assistant for CS130B – Algorithms Jan. 2020 - Mar. 2020

- Hosted open lab hours for students to ask for help with homework and programming assignments.
- Held review sessions before exams and gave one-on-one feedback for students who requested it.

Grader/Reader for MATH8 – Intro. to Higher Math Jan. 2020 - Mar. 2020

- Graded homework and offered feedback to students.

College of Creative Studies Community Council Officer Jan. 2020 - Present

- Plan various events throughout the quarter for CCS students.
- Coordinated and cohosted the first CCS Integration Bee.

AWARDS & ACTIVITIES

· UCSB SciOly Fermi & Code Busters Event Supervisor 2019, 2020
· Top 35% in Putnam Mathematics Competition 2018
· Ohlone Certificate of Accomplishment in Pure Mathematics 2018
· Lockheed Martin CodeQuest & Stanford ProCo Coding Competitions 2018