Curriculum Vitae

Xin (Donald) Lin

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Education

Davidson College Davidson, NC
Bachelor of Science in Computer Science and Mathematics *Aug 2020 – May 2024 (Expected)*

- Cumulative GPA: 3.915/4.000 | GRE: 332/340 (July 2023)
- Computer Science Major GPA: 3.930; Mathematics Major GPA: 4.000
- Relevant Coursework: Machine Reasoning, Theory of Computation, Database Systems, Computer Organization, Numerical Analysis, Probability, Combinatorics, Abstract Algebra

Research Experience

Machine Intelligence Lab, Davidson College May 2023 – Current
Research Assistant, supervised by Professor R. Ramanujan *Davidson, NC*

- Initiated an in-depth comparative analysis of AI chess agents using **adversarial search** techniques, focusing on minimax search and Monte Carlo tree search
- Designed and executed $100,000+$ simulations on high-entropy and unconventional chess positions to evaluate AI **decision-making** capabilities and vulnerabilities
- Highlighted the versatility of **Deep Neural Networks** beyond the training phases, prompting further investigation into innovative AI search methods
- Engineered a novel agent integrating **minimax search** and neural networks, exploring the synergy between heuristic algorithms and neural networks (theme of my **senior thesis** in progress)

Facility for Rare Isotope Beams (FRIB), Michigan State University May 2022 – Sept 2022
Research Assistant, supervised by Professor M. Kuchera, R. Ramanujan *East Lansing, Michigan (Remote)*

- Created customized **Reinforcement Learning** (RL) environments to optimize tuning of hundreds of magnets in the particle accelerator
- Extended **OpenAI Gym** with **PyTorch** randomization to facilitate robust testing of RL environments
- Proved RL's potential to streamline the traditional process of extensive trial and error by achieving a solution within a 0.04% gap to optimal
- Presented poster at 2022 Sigma Pi Sigma Physics Congress in Washington DC, with 1200+ participants

Zhejiang University School of Medicine Nov 2017 – Mar 2018
Research Assistant, supervised by Professor L. Zeng *Hangzhou, Zhejiang*

- Conducted wet lab experiments on the physiological effects of nitrous oxide on lab rats, with **time series** analysis
- Fund-raised over $1000 dedicated to drug treatment donations

Short Talks and Posters

1. Xin Lin. "Reinforcement Learning for Tuning Magnets at FRIB." *Davidson Fall Research Symposium*, September 2022; *Sigma Pi Sigma Physics Congress*, October 2022. Poster, Short Talk.
2. Xin Lin. "Linear Programming for Meal Optimization at Commons." *Davidson College Verna Miller Case Symposium*, April 2023. Poster.
3. Xin Lin. "Exploring Weaknesses in AI-Powered Chess Agents." *Davidson Fall Research Symposium*, September 2023. Poster, Short Talk.

Teaching Experience

Davidson College

- Grader & Tutor, PHY-125 General Physics I w/Calc (34 students) Fall 2022
- Grader & Tutor, PHY-235 General Physics II w/Calc (27 students) Spring 2023
- Grader, MAT-235 Differential Equations (28 students) Fall 2023
- Math/CS general Tutor: Counseled 20+ students with coding (Python, Java) and computational (Calculus, Linear Algebra, Discrete Structures) problems Fall 2022 - Current
- Chinese Apprentice Teacher: Mentored 20+ students through 100+ instructional hours, facilitated advanced topic lectures, and supervised students' independent research projects Fall 2021 - Spring 2022

Grants and Awards

- Davidson College Alvarez Academic Grant — Fall 2023
- Davidson College Weinstein Grant — Fall 2023
- Davidson College R. Craig and Sheila Yoder Applied Research Fellowship — Spring 2023
- Honor Society: Sigma Pi Sigma (society for physics and astronomy) — Fall 2022
- National Silver Award, American Regional Mathematics League (ARML) — Fall 2019

Technical Skills

- Proficiency in Python (NumPy, Pandas, Matplotlib, Seaborn, Scikit-learn), Java, MySQL/SQLite, C/C++
- Experience with Tensorflow, PyTorch, Assembly Language, HTML, R, Mathematica, Matlab, Racket

Related Experiences

'Cats Stats Sports Analytics Group — Oct 2021 – Mar 2023

Data Analyst — *Davidson, NC*

- Analyzed game data (player shot locations, historical metrics) for Davidson Wildcats Women's D1 Basketball team
- Leveraged Python libraries to perform regression analyses and probabilistic modeling, creating heatmaps to visualize players' shooting accuracies at different spots
- Applied time-series analysis to forecast performance trends and patterns of starting players

Professional Service and Volunteering

- *Coordinator*, Davidson College Math/CS Dept. Quiz Center (current)
- *Panelist*, Research Opportunities at Liberal Arts Colleges (July 2022)
- *Volunteer*, Charlotte Community Health Clinic (Fall 2021, Spring 2022)