

# Will Corcoran

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## EDUCATION

### University of California, Santa Barbara (UCSB)

Master of Science in Computer Science, GPA: 4.0

Bachelor of Science in Computer Science, GPA: 4.0

Santa Barbara, CA

Sep. 2024 - June 2026

Sep. 2022 - June 2025

## RELEVANT EXPERIENCE

### Undergraduate Research Assistant

Dynamo Lab: Dynamic Networks, UCSB

Sep. 2023 – Present

Santa Barbara, CA

Targeted Edge Perturbations on GNNs

Poster: ERSP

- Approximate the robustness of 5 graph neural network architectures to edge perturbations, contrast results to adversarial attack responses.
- Evaluate the effectiveness of 4 heuristic approaches to maximize edge additions while preserving model accuracy.
- Invented a two-part greedy-primed gradient attack by analyzing graph characteristics and extensive literature reviews.

Benchmarking and Improving Large Language Models on Graph Datasets

Paper: NeurIPS (in review)

- Collected 20 undirected graph problems with a varying degree of difficulty, structure, and intended algorithms.
- Generated the first extensive graph dataset of 2000 test cases for 12 different graph categories with NetworkX.
- Prompted 160 solutions across 8 LLMs, while measuring performance on test cases and categories.

### Software Engineering Intern

Music Audience Exchange (MAX)

June 2024 – Sep. 2024

Dallas, TX

- Delivered algorithms to gather and format various metadata for 1000s of artist sites into well-structured JSON, improving data collection times by up to 1,500%.
- Developed and tested Cloudflare Workers for backend using Vitest and Node.js, enhancing scalability and performance.
- Contributed to complex GCP workflows, and maintained parallelized systems with over 30 steps.

### Undergraduate Learning Assistant

Data Structures and Algorithms, UCSB, Computer Science

Apr. 2024 – June 2024

Santa Barbara, CA

- Conducted office hours for over 100 students, provided support regarding homework, exams, and programming problems.
- Graded 800 assignments and administered 2 exams, ensured students understand complex, challenging concepts.
- Corresponded with the teaching team to ensure optimal student learning and manage course pace.

### Fullstack Software Engineering Intern

Haggard Labs

June 2023 – Sep. 2023

Fort Worth, TX

- Assisted the launch of a financial wealth aggregation application, focused on user experience and efficient response times.
- Optimized data writing and retrieval by up to 80% through NoSQL database management.
- Engineered secure serverless functions to retrieve financial data from external entities via RESTful APIs, leveraging Express.js, Node.js, and Firebase Cloud Functions.

## PROJECTS

### Talking Theory | Python, Numpy, NetworkX

June 2024 – Present

- Record short instructional lectures from seminal, popular, or provoking literature pertaining to theoretical computer science with a focus on combinatorial or randomized algorithms.

### NcaamGNN | Python, Pandas, Selenium, Numpy, PyTorch Geometric

Dec. 2023 – Present

- Implement weighted link prediction graph neural network architecture to forecast outcomes of college basketball games.
- Collect, clean, and manage more than 100,000 pieces of data with 100s of features using Selenium and Pandas, while utilizing PyTorch Geometric to model and organize data as graph dataset.

### FillerAI | TypeScript, Next.js, GitHub Actions

Sep. 2023 – Dec. 2023

- Produced an AI player for a strategy game using Minimax with Alpha-Beta pruning algorithms to make quality moves.
- Formulated specific mathematically rigorous evaluation function to quantify board states for AI player.
- Employed Next.js to develop a seamless and interactive environment, ensuring less than 1 second response from AI player.

### Verde | TypeScript, Firebase, React Native, Expo

Dec. 2022 – Mar. 2023

- Crafted a social media app, Verde, with daily environmentally-focused challenges along with photos and user interaction.
- Contributed with a team of 3 others in an Agile development process using React Native, Expo, and Firebase.
- Awarded 1st place in UCSB's Google Developers' 2023 Solution Challenge.

### Startup Company Success Predictor | Python, NumPy, Scikit-learn

Sep. 2022 – Dec. 2022

- Built a predictive model for startup companies based on a holistic view of their founding, funding, and fundamentals.
- Produced a Random Forest Classification model using Scikit-learn, NumPy, and Pandas.
- Increased accuracy by 22% over ground truth predictions with careful consideration of parameters.

LEADERSHIP & VOLUNTEERING EXPERIENCE

<b>Leadership Committee, CRU, Real Life</b> <ul style="list-style-type: none"><li>Coordinate and plan weekly events, meetings, and dinners; ensure all resources are supplied.</li></ul>	Sep. 2023 – Present
<b>Middle School Math Volunteer</b> <ul style="list-style-type: none"><li>Led a group of five or more students down paths to accomplish classwork and review homework.</li></ul>	June 2023 – Present
<b>Independent Label Music Executive, 9929 Records</b> <ul style="list-style-type: none"><li>Establish three artists from the ground up using image and likeness, sound, and social media.</li><li>Create, produce, and publish five albums and more than 150 songs with over 600,000 streams.</li><li>Assess trends and data to create a marketing plan for each release and performance.</li></ul>	Aug. 2021 – Present

HONORS

<i>Early Research Scholar</i>	Sep. 2023 – June 2024
<i>Regents Scholar</i>	Sep. 2022 – Present
<i>College of Engineering Honors</i>	Sep. 2022 – Present
<i>Dean's Honors</i>	Sep. 2022 – Present

RELEVANT COURSEWORK

Data Structures and Algorithms, Algorithms Engineering, Finite Automata, Linear Algebra, Computational Science, Computer Architecture, Compilers, Machine Learning, Artificial Intelligence, Deep Learning, Quantum Computing, Fine-Grained Complexity, Probability and Statistics, Multivariable Calculus, Differential Equations
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TECHNICAL SKILLS

<b>Languages:</b> Python, C++, JavaScript, TypeScript, Java, Rust, SQL, HTML/CSS
<b>Frameworks:</b> React Native, Node.js, React.js, Next.js, Django, Flask, Expo
<b>Developer Tools:</b> Google Cloud Platform (GCP), Cloudflare, Vitest, Bash/Scripting, Git/GitHub, Docker, Postgres, NoSQL DBs
<b>Libraries:</b> Scikit-learn, PyTorch, PyTorch Geometric, NetworkX, Pandas, NumPy, Matplotlib

PAPERS

[1] Qiming Wu, Zichen Chen, Will Corcoran, Misha Sra, and Ambuj K. Singh. Grapheval2000: Benchmarking and improving large language models on graph datasets, 2024.
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