Matthew Zarate

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Education

University of California, Berkeley — Berkeley, CA
Bachelor of Arts in Computer Science, Data Science — *2022 - 2026*

Relevant Coursework : *Data Structures, Algorithms, Probability and Random Processes, Principles and Techniques of Data Science (SQL/PostgreSQL), Structure and Interpretation of Computer Programs*

Experience

Junior Software Engineer — March 2026 – October 2026
PolicyBound Inc. — *Berkeley, CA*

- Develop full-stack features using Angular (TypeScript) and Spring Boot (Java), implementing REST API endpoints and integrating with MongoDB for data persistence in surety bond management workflows
- Identified and resolved a company-wide timeout in customer creation, cutting response time from 3+ minutes to under 1 second (∼200x) and unblocking QA and UAT teams who create these accounts daily for testing
- Eliminated 8 full scans (1.7M MongoDB documents per scan) by restructuring aggregation pipelines to maximize index usage, restructuring lookups and joins, and adding case-insensitive collation and compound indexes
- Presented root-cause findings to CTO and prepared MongoDB query best practices for the engineering team, which became standardized across the entire codebase
- Manage code deployment through Git feature branch workflows and Agile methodology, collaborating with senior engineers on code reviews and sprint planning via Jira

Senior Computer Science Mentor — January 2024 – Present
CSM at UC Berkeley — *Berkeley, CA*

- Mentoring undergraduates (pedagogy/technical) at CSM, UC Berkeley's largest computer science organization
- Leading content team, designing worksheets on data structures and algorithms serving ∼100 students, weekly
- Teaching data structures and algorithms to groups of undergraduates enrolled in CS 61B
- Led exam review sessions in Wozniak Lounge for 50+ students, delivering lecture-format presentations on core data structure concepts including Java collections, trees, graphs, sorting algorithms, and asymptotic runtime analysis

Undergraduate Research Assistant — June 2020 – August 2020
Physics Department at University of California, Santa Cruz — *Santa Cruz, CA*

- Worked with Professor Ramirez-Ruiz to develop computational models in Python for testing new theoretical outcomes of binary black hole collisions
- Queried various numerical databases from Modules for Experiments in Stellar Astrophysics (MESA) and tested the physical structure of stellar objects via current common envelope evolution theory
- Classified hundreds of 2D physical models of stellar merger events and quantified a statistical relationship that predicts whether a binary collision had occurred based on LIGO's O2 data release
- Presented these findings to astrophysics research groups at UC Santa Cruz

Projects

NGordnet | *Java, Python* — October 2023 – December 2023

- Replicated Google's WordNet, a database representing hierarchical relationships across English semantics
- Implemented graph data structure with depth-first search traversal using adjacency list representation, leveraging the recursive nature of WordNet's hierarchical relationships
- Built the Ngrams Map ADT along with custom Time Series methods for querying multivariable WordNet data, allowing users to retrieve relative frequency of given sets of text between years 1470 and 2020

Technical Skills

Languages: Java, Python, C, JavaScript/TypeScript, SQL, Scheme
Frameworks & Libraries: Angular, Node.js, Spring, Spring Boot, Project Lombok, Pandas, NumPy, Matplotlib
Databases: MongoDB, PostgreSQL
Developer Tools: Git, IntelliJ, Visual Studio Code, MongoDB Compass, Jira, Bitbucket