Nelson Booth

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https://github.com/NelsonBooth

Education

University of California, Santa Cruz Santa Cruz, CA
Bachelor of Science in Computer Science *Sept. 2021 – June 2025*

- Relevant Coursework: Data Structures and Algorithms, Object Oriented Programming (C++, Python), Machine Learning and Data Mining
- Affiliations: UCSC ACM, UCSC ITS, CruzHacks @UCSC

Experience

IT Consultant October 2022 – Present
UCSC Information Technology Services (ITS) *Santa Cruz, CA*

- Assisted fellow UCSC students and teacher assistants (TAs) in computer labs with technical problems such as printing, logins, and software issues.
- Helped co-host discussion sections for various computer science classes ranging from a variety of subjects such as game design to computer architecture, etc.

Projects

Housing Prices Prediction | *Python, GitHub, SciKit-Learn, Pandas, React* January 2024 – March 2024

- Employed a Random Forest Regressor model on CSV files containing housing features such as number of rooms, location, square footage, etc.
- Preprocessed housing data using StandardScalar and OneHotEncoder ensuring proper preparation for model training.
- Improved housing price prediction by 35% utilizing hyperparameter tuning when compared to previous iterations of the model.
- Utilized React to develop a user-friendly interface allowing users to input relevant data for predicting housing prices.

Evolving Mario Levels | *Python, Unity, Git, Numpy, Pathfinding, Multiprocessing* January 2024 – February 2024

- Implemented an evolving Mario level generator that evolves based on certain factors such as fitness levels and selection strategies.
- Improved level generation by 30% using metrics to calculate fitness levels of genome individuals on a heap and mutated these individuals to generate new children for the next evolved level.
- Utilized pathfinding algorithms such as Dijkastra's Shortest Path to determine the most optimal number of moves to beat an evolved Mario level.
- Engineered two selection strategies: tournament and roulette selection to filter out the parents of the next generation.

CineScore | *Vite, Typescript, Tailwind CSS, SQL, Python, Flask, MovieDB API, Bash* June 2023 – November 2023

- Developed a full-stack web application using Flask serving a REST API with React as the frontend
- Engineered a relational database using Microsoft Azure SQL, guided by ER diagrams, to efficiently manage user and movie data. Crafted SQL queries to streamline backend data retrieval.
- Ensured robust application performance through comprehensive Python unit testing. Prioritized user privacy by implementing encryption for user data and integrating secure authentication protocols.
- Adopted Agile practices to optimize team collaboration and project management, resulting in a 20% acceleration in project delivery.

Technical Skills

Languages: Python, C/C++, SQL, HTML/CSS, JavaScript
Frameworks: React, Node.js, Tailwind CSS, Material-UI, FastAPI, Flask
Tools: Git, WSL, Linux, LaTeX, Jupyter Notebook, VS Code, Slack, GitHub
Libraries: pandas, NumPy, Matplotlib, requests, Scikit-Learn, PyTorch, JSON