Fnu Kalkin

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Education

University of California San Diego — La Jolla, CA

B.S. in Computer Engineering - 3.97/4.00 GPA — *September 2022 – June 2025*

- Relevant Courses: Machine Learning (Grad), Deep Learning, Systems Programming, Probability/Statistics, Graph Theory (Honors), Discrete Math, Intro to Data Science, Analog Circuits, Signals and Systems, Adv. Data Structs

Experience

Undergraduate Researcher — April 2023 – Present

University of California, San Diego - Scripps Institute of Oceanography — *La Jolla, CA*

- Building a recurrent neural net to predict trajectories of Argo floats in order to to make the best use of the $70 million of annual U.S. government funding allocated towards this observing system
- Wrote open source scripts for downloading sea surface height data and individual Argo float trajectories
- Wrote a script to download and parse all monthly extensions to the Roemmich-Gilson Argo Climatology and calculate the empirical orthogonal functions of the temperature and salinity profiles
- Reduced the dimensionality of temperature and salinity data by 83% using the EOF decomposition

Undergraduate Instructional Assistant — April 2023 – June 2023

University of California, San Diego - Halıcıoğlu Data Science Institute — *La Jolla, CA*

- Tutored undergraduate students in a data structures class and facilitated learning by proctoring exams, conducting weekly office hours, answering ∼100 questions on the online class forum, and developing and grading assignments
- Helped students gain proficiency in Java, debugging, and the process of writing unit tests in weekly office hours
- Developed homework for the heaps unit, enabling students to implement a d-ary heap, a priority queue, and the K-Nearest Neighbors algorithm on the MNIST dataset
- Developed a graphics engine using StdDraw to let students visually test their K-NN models on MNIST
- Made a review assignment to let students practice the application and design of data structures and algorithms covered throughout the term by implementing data structures such as an LRU Cache and a Max-Stack

Projects

UCSD GPA Visualization | *Python, Pandas, Selenium, HTML, CSS, JavaScript, D3.js*

- Developed a front-end web application using D3.js, HTML and CSS to display GPA and enrollment data for all courses at UCSD, contains tooltips that show additional details for each course on hover
- Scraped and cleaned over 65k rows of data using Selenium and Pandas to make the bubble chart
- Hosted the website on Github Pages and received over 1300 cumulative views

Music Analysis Bot | *Python, PostgreSQL, Pytorch, Spotify API, Last.fm API*

- Created a Discord bot that uses a PostgreSQL database to keep track of user IDs/statistics and OpenCV to generate graphical charts, integrated with a feed-forward neural net to predict genres of user-provided songs
- Used Last.fm and Spotify API calls to compare statistics between users and retrieve data for music charts
- Wrote a RateYourMusic scraper to find over 6,000 songs of 5 different genres to train the neural net
- Used spotipy to vectorize each song into its feature values and acheived 66% classification accuracy on the neural net through an MLP, compared to 62% with linear regression and 60% with K-Nearest Neighbors

Gitlet | *Java, Git, io*

- Developed a version control system like Git that allows users to create, track, and manage multiple versions of files
- Implemented core features such as commit, branch, checkout, merge, and reset using object-oriented programming
- Stored the system's data in a file-based structure that used serialization to save commits and blobs
- Wrote merge conflict resolution algorithms that allow for automatic and manual resolution of merge conflicts

Technical Skills

Languages: Java, Python, C, C++, SQL
Tools/Libararies: JUnit, Git, Regex, Linux, LaTeX, Pandas, Numpy, PyTorch, OpenCV, StdDraw
Awards: AIME qualifier, USACO Silver Medalist, Provost Honors (Dean's List), MSJHS Valedictorian, 2x FTC Control Award, AP Scholar with Distinction, National Merit Commended Student