# Fnu Kalkin

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## EDUCATION

**University of California San Diego**                                     La Jolla, CA
*B.S. in Computer Engineering, Mathematics*                      *September 2022 – June 2025*

- 3.95/4.00 overall GPA, 4.00/4.00 major GPA (both majors), course list available here

## EXPERIENCE

**Undergraduate Researcher**                                      April 2023 – June 2024
*University of California, San Diego - Scripps Institute of Oceanography*          *La Jolla, CA*

- Created a 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 by optimizing the float distribution
- 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 93% while capturing 99.9% of the varaiance
- Used the Kalman Smoother to remove small-scale variability in sea surface height and bathymetry data
- Presented results at two conferences and secured funding through the TRELS Scholarship twice

**Undergraduate Tutor**                                           April 2023 – June 2024
*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 200+ questions on the online class forum, and grading assignments and exams
- Helped students gain proficiency in Java, debugging, and the process of writing unit tests in weekly office hours
- Helped develop four homework assignments and made animations to demonstrate B-Tree algorithms

## 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, Provost Honors (Dean's List), 2x TRELS Scholar, 2x Revelle College Honors