Alan Lin

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Education

Boston University Expected (May 2026)

Bachelor of Arts in Computer Science *Boston, MA*

- **Relevant Coursework:** Data Science Tools & Applications, Database Systems, Computing Systems, Software Engineering, Web App Development, Analysis of Algorithms, Functional Programming, Statistics, Linear Algebra, Discrete Math, Data Structures & OOP in Java

Experience

City of Boston Sep. 2024 - Present

Data Analyst *Boston, MA*

- Analyzed and modeled City of Boston's operating and capital budget data, examining over 10 years of budget data across 50+ departments, identifying spending trends and discrepancies
- Developed and deployed decision tree models (RandomForest, XGBoost) and clustering algorithms that improved the accuracy of budget allocation insights by 20%
- Created 10+ interactive visualizations, including bar charts, choropleth maps, and scatter plots, providing actionable insights that influenced strategic decisions on per capita spending in critical areas such as education and housing.

Boston University Jan. 2024 - May 2024

Software Engineer : Full-Stack Developer *Boston, MA*

- Streamlined meal planning for users by creating an app that fetches recipes based on available ingredients, improving user convenience by 30%, by integrating the Spoonacular API and Unwrangle Sam's Club API
- Ensured quick and easy retrieval of past recipes, reducing search time by 40%, by storing and managing user's histories in Firebase' Firestore
- Integrated Google OAuth login via Firebase, enhancing user security and streamlining authentication; increased user retention by 15% and reduced login-related issues by 30%

Projects

Latent Semantic Analysis Search Engine | *Python, Flask* Oct. 2024

- Built a search engine that uses Latent Semantic Analysis (LSA) to retrieve top 5 relevant documents from a dataset of 18,000+ documents with 95% accuracy based on cosine similarity
- Designed a responsive web interface, handling user queries in real time with document retrieval latency under 200ms, and visualized cosine similarity scores via bar charts.
- Reduced dimensionality of the term-document matrix by 85% using Singular Value Decomposition (SVD), leading to a 50% improvement in query processing speed while maintaining high retrieval accuracy.

KMeans Clustering Visualization | *Python, Flask, Javascript* Sep. 2024

- Developed an interactive web application to visualize the KMeans Clustering algorithm with 4 initialization methods (Random, Farthest First, KMeans++, Manual)
- Engineered a dynamic clustering process visualization with step-by-step playback and manual centroid selection, allowing users to track algorithm convergence in under 5 seconds for datasets of up to 100 points
- Optimized clustering performance and visualization rendering, reducing load times by 20% for large datasets

SProfile | *ReactJS, NodeJS, ExpressJS, Firebase* Apr. 2024

- Harnessed the Spotify API to retrieve extensive data on users, artists, albums, playlists, tracks and player information, resulting in a 20% improvement in user experience
- Incorporated the TicketMaster API to deliver real-time updates on upcoming artist events, resulting in a 15% increase in app usage frequency
- Implemented Spotify's OAuth system for user authentication, ensuring seamless access to personalized music content and features; reducing unauthorized access incidents by 25%

Technical Skills

Languages: Javascript, HTML/CSS, Java, Python, Bash/Shell, x86 Assembly Language, OCaml, C, SQL, XML
Frameworks/Libraries: ReactJS, ExpressJS, NextJS, ViteJS, NumPy, Flask
Developer Tools: Git/GitHub, Postman, Visual Studio Code, Webstorm, Firebase, Jupyter Notebook, LaTeX