Dwain Anderson

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Education

Cornell University, Ithaca, New York   August 2023– December 2026 (Expected)

Bach. Arts in Computer Science, Bach. Arts in Statistical Science

Related Courses: Object-Oriented Programming & Data Structures, Software Systems, Functional Programming, Database Systems, Machine Learning, Backend Development, iOS Development, Web Programming, Data Analytics

Technical Skills

Programming Languages: Java (proficient), Python (proficient), TypeScript (proficient), HTML/CSS (proficient), JavaScript (intermediate), OCaml, (intermediate), PHP (intermediate), Swift (beginner), C/C++ (beginner)

Frameworks & Technologies: Git, Docker, Postman, SQL, React, Next, Flask, Pandas, jQuery

Project Experience

Cornell CourseSphere | *TypeScript, Python, React, Flask, SQL*   [GitHub Repository](#)

- Engineered a TypeScript and React frontend for a retrieval augmented generation web-app, implementing a k-batch dynamic save chat feature that **reduced network calls by 10%.**
- Utilized multi-threading and parallelization to read **19,000 rows** in an **SQL database and transfer it to a csv file within 0.01 seconds.**
- Integrated Reddit's API to collect course-related data points, populating a SQL database to be used for LLM prompts, resulting in an improvement in RAG recommender accuracy.
- Optimized backend architecture by structuring RESTful API endpoints and standardizing HTTP error codes, resulting in streamlined user authentication with the Firebase database.

Vector Space | *Python, SQL, Machine Learning, Tokenization*   [GitHub Repository](#)

- Developed a web-crawler capable of autonomously **visiting 60,000 webpages and indexing 900 unique URLS**, storing the extracted content in a SQL database.
- Optimized SQL database to efficiently store and index **5,000,000 bits of English-translated text-content** in a SQL database, enabling rapid retrieval for natural language processing tasks.
- Engineered thread-safe BFS, K-NN, and K-means clustering algorithms for webpage network graph analysis, utilizing multithreading to **process 60,000 webpages 1.6 times faster than single-threaded approaches.**
- Utilized tokenization, Word2VeC SkipGram, and PCA to compute **25-dimensional vector representations** of web-scraped content, storing these vectors into a vectorized SQL database.

Image Selection Processor | *Java, JUnit, Swing*

- Developed an intuitive Java Swing-based image processing tool, featuring real-time selection preview, supporting multiple selection modes.
- Implemented Dijkstra's algorithm, min-heaps, and multi-threading for real-time shortest path computation between user-selected points, **achieving speed optimizations up to 5x** after unit testing with JUnit.
- Developed a feature-rich GUI incorporating live wire contouring and intelligent edge detection, enhancing user control with intuitive cancellation/undo options.

Spreadsheet Formula Evaluation | *Java, JUnit*

- Developed a versatile formula evaluation system supporting algebraic CSV formula types, leveraging subtype polymorphism to **achieve a 33% reduction in code duplication and improve maintainability.**
- Utilized tree and stack data structures for expression evaluation, **optimizing performance to $O(n)$ runtime compared to the $O(n^2)$ brute force approach**.