

Adrian Wang

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Education

University of Pennsylvania – School of Engineering and Applied Science

May 2022

Master of Science in Engineering: Data Science

Bachelor of Science in Engineering: Networked and Social Systems Engineering (NETS)

Foundational Courses: Data Structures and Algorithms (Java), Discrete Math, Engineering Probability, Linear Algebra

ML Courses (Python): Interactive Fiction, Computational Linguistics, Artificial Intelligence, Big Data Analytics, Crowdsourcing and Human Computation

Other Courses: DevOps (Python/Docker/Kubernetes), Database and Information Systems (JS/Postgres/MongoDB), Scalable and Cloud Computing (JS/DynamoDB/EC2), Science of Data Ethics (Python), Advanced Programming (Haskell)

Experience

UPenn – CIS559 Teaching Assistant (Programming and Problem Solving; Java)

January-May 2022

- Rewrote and parallelized sections of course codebases to minimize runtime overhead during large-scale testing of student code
- Modified APIs and created documentation for course codebases to encourage performant student implementations

UPenn – CIS120 Teaching Assistant (Programming Languages and Techniques I; OCaml, Java)

September 2020-May 2022

- Led a committee focused on overhauling homework assignments and writeups to improve functionality and clarity
- Taught weekly recitations to reinforce important code concepts with worked examples and code demos
- Helped students overcome difficult concepts and implementation problems during weekly office hours and individual code reviews

eBay – Software Engineering Intern (Experimentation Runtime Platform; Java, Python)

May-August 2021

- Reduced encoding/decoding times of a central HTTP header by over 90% by implementing single-pass cache-friendly strategies
- Compressed header size by over 80% with base-95 encoding to shrink numerical elements while eliminating delimiters
- Assessed runtime with JMH and size with JOL/HTTP utilities, then analyzed results with Python and Pandas

Annaly Capital Management – Information Technology Intern (C#, React, SQL)

May-August 2020

- Created .NET Core package and ASP.NET REST API to give developers straightforward access to a proprietary file storage system
- Enabled users to start automated reruns of financial procedures with changes to React frontend and SQL/ASP.NET backend

Projects

NoteToSelf (Team of 5 – Python)

August 2021-May 2022

- Created a web application to turn lecture recordings into summarized lecture notes, transcribing raw audio with Amazon Transcribe then summarizing with GPT-3.
- **Personal contributions:** Wrote all code relevant to GPT-3; split initial transcripts into chunks; determined topic similarity with GPT-3 queries and sentence embeddings; designed prompts to use previous summaries as iteratively built context for future summaries; manually adjusted outputs and fine-tuned GPT-3 resulting in significantly increased summary quality and reduced summarization cost

Mosquito Game Algorithm (Team of 3 – Java)

April 2021

- Created a generalized algorithm to collect 50% of the mosquitoes on a game board as quickly as possible by placing lights that attracted mosquitoes in a fixed radius, which then relayed the mosquitoes to a central collector while avoiding light-blocking walls.
- **Personal contributions:** Wrote all functional code for the project. Implemented ray tracing to assess effectiveness of light placement; created ray tracing heuristic to quickly approximate visibility polygon intersections; wrote gap width detection to account for randomness of mosquito movement; implemented cache with parallelized initialization to enable fast approximated visibility lookups; implemented 2D operations using 1D primitive arrays, minimizing pointer-chasing and maximizing CPU cache-friendliness

Finger Trees (Team of 2 – Haskell)

November-December 2020

- Implemented a complex functional data structure with $O(1)$ deque operations and splitting/indexing in logarithmic time
- **Personal contributions:** Implemented splitting, indexing, and various other complex finger tree functions; adapted the generic finger tree type to an easily testable index-based variant; implementing priority queues using finger trees; created an interactive demo to showcase the performance of finger trees with queue operations and random access; benchmarked performance relative to common data structures while accounting for lazy evaluation
- **Other features:** Automated generation and property-based testing of finger trees with QuickCheck, implementation of ordered sequences based on finger trees

CollegeBnB (Team of 4 – JavaScript, SQL/Postgres)

March-April 2020

- Built web app to help applicants plan college visits by finding universities and nearby Airbnbs that fit their preferences for size, location, acceptance rate, average SAT/ACT scores, etc. on a React frontend
- **Personal contributions:** Implemented BCNF Postgres model to reduce redundancy, wrote parametrized query framework that discouraged SQL injection and simplified filter operations involving alphabetical or numerical fields, improved query performance

Languages

Java, Python, SQL, JavaScript (React, Node), C#, HTML, CSS, OCaml, Haskell, Coq, MATLAB, C, C++