Darren Wang

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Education

University of Pennsylvania May 2028
B.S.E. in Computer Science; GPA: 3.99/4.0 *Philadelphia, PA*

- **Relevant Coursework:** Operating Systems, Databases, Algorithms, Machine Learning, Computer Vision, Big Data Analytics, Scalable Cloud Computing, Computer Systems, Graph Neural Networks, Natural Language Processing.

Technical Skills

Languages: Python, C/C++, Java, OCaml, SQL, JavaScript, TypeScript, HTML/CSS
Frameworks & Tools: React, React Native, Node.js, Express, PostgreSQL, MongoDB, Neo4j/Cypher, PyTorch, scikit-learn, NumPy, polars, Docker, AWS, Apache Spark

Experience

Penn Spark Feb. 2026 – Present
Software Developer – Atelic Travel Client Project *Philadelphia, PA*

- Rebuilt public-facing marketing pages for Atelic, a travel-planning startup, using React, Tailwind CSS, and React Router.
- Built reusable navigation, landing, footer, and contact components with responsive layouts, App Store CTAs, custom typography, and Formspree-backed lead capture.

Certitude (YC Backed) Feb. 2025 – May 2025
Software Engineering Intern *Philadelphia, PA*

- Built vector embeddings to power semantic search across a full-stack EdTech platform serving 10,000+ users.
- Developed a Python web scraping pipeline to collect, clean, and structure large-scale datasets for AI-powered personalization features.

University of Pittsburgh Aug. 2023 – Present
Research Intern *Pittsburgh, PA*

- First-authored a manuscript submitted to *Nature Communications* evaluating AlphaFold 3 robustness, generalization, and binding-affinity correlation across 2,000+ protein-peptide predictions.
- Engineered a protocol utilizing ANI-2x and a custom conjugate gradient optimizer to rerank AlphaFold 2 predictions, achieving 34% Top-1 accuracy on challenging blind test sets.

Penn Aerospace Club Sept. 2024 – Present
Software Engineer *Philadelphia, PA*

- Developed low-level C++ firmware for microcontrollers to process real-time atmospheric and navigational sensor data.
- Built machine learning models to predict weather patterns using data collected from semesterly high-altitude balloon launches.

Projects

PennOS | *C, Operating Systems, File Systems* May 2026

- Implemented a Unix-like teaching operating system in C with a preemptive priority scheduler, process lifecycle management, job control, and a POSIX-style shell.
- Built process abstractions for PCBs, spawning, waiting, signaling, sleeping, orphan reparenting, zombie reaping, and terminal signal forwarding.
- Integrated a custom FAT-style file system with kernel-level open/read/write/close/unlink operations, file permissions, descriptor duplication, and single-writer enforcement.

Anime Recommendation Query Engine | *React, Node.js, PostgreSQL, AWS RDS* May 2026

- Built a full-stack analytics and recommendation app over 31M+ user-anime interactions using React, Express, PostgreSQL, and AWS RDS.
- Optimized high-cost recommendation queries with indexing, materialized views, query restructuring, and API caching, reducing representative latency from ∼35s to ∼50ms.
- Implemented parameterized SQL endpoints, ETL scripts, and backend route tests covering Express middleware, routes, and database utilities.

Distributed Social Graph Engine | *Apache Spark, AWS EMR, DynamoDB* Dec. 2025

- Architected a scalable social network backend on AWS, utilizing DynamoDB for low-latency storage and EC2 for stateless application hosting.
- Implemented a parallelized adsorption algorithm using Apache Spark on AWS EMR to power a news recommendation engine over weighted graph edges.
- Integrated Apache Livy to orchestrate asynchronous Spark jobs from the Node.js backend, ensuring non-blocking recommendation updates.