Shin Yu (Melody) Hu

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EDUCATION

Carnegie Mellon University
Pittsburgh, PA

Bachelor of Science in Computer Science　　　　　　　　　　　　　　　　　　　*Expected Dec. 2025*

- **Relevant Coursework**: Distributed Systems, Database Systems, Database Query Optimization, Machine Learning, Computer Security, Data Structures & Algorithms
- **Awards**: FS-ISAC Women in Cyber Scholarship, VIP Women in Tech Scholarship, KIPP Rales Scholarship
- **Involvements**: TartanAUV (Software), Rewriting the Code, CodePath, GHC '24

EXPERIENCE

Distributed Systems (15-440) Teaching Assistant
Jan. 2025 – May 2025

School of Computer Science @ Carnegie Mellon University　　　　　　　　　　　*Pittsburgh, PA*

- Led recitations, created problem sets and exams, and held debugging and conceptual office hours to support the learning of over 100 students, collaborating closely with professors to align on course goals
- Guided students through projects on distributed communication protocols, concurrency, networking, performance trade-offs, and system design, fostering their understanding of core distributed systems concepts

Software Engineering Intern
May 2024 – Aug. 2024

LinkedIn　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　*Sunnyvale, CA*

- Developed Spark scripts using Scala to transform audience targeting datasets, grandfathering deprecated member attributes and resolving a data staleness issue that impacted targeting accuracy of over 50,000 ad campaigns
- Designed and implemented automation of monitoring & verification during the grandfathering process, ensuring accurate and timely updates of audience targeting data while reducing completion time from 1 month to 2 weeks

Discrete Math (15-151) Tutor
Jan. 2024 – May 2024

School of Computer Science @ Carnegie Mellon University　　　　　　　　　　　*Pittsburgh, PA*

- Provided tailored one-on-one tutoring sessions for two students currently taking 15-151, reviewing key concepts in discrete mathematics and working through practice problems with them to solidify their understanding

Quantum Computing Intern
June 2023 – July 2023

C2QA @ Brookhaven National Laboratory　　　　　　　　　　　　　　　　　　*Remote*

- Developed 50+ Python programs to solve and model quantum information science problems by employing advanced mathematical and physical principles such as differential equations, Fourier transform, and Monte Carlo Methods
- Created code with Python libraries and IBM Qiskit that enables visualization and analysis of datasets, mathematical function behaviors, and quantum circuits, resulting in insights into quantum behavior

PROJECTS

Relational Database Management System | *C++*

- Developed a thread-safe buffer pool manager, B+ tree index, and optimistic multi-version concurrency control as core components of a database management system (DBMS)
- Designed and implemented operator executors to execute SQL queries and apply optimizer rules, transforming query plans to enhance DBMS query execution

Query Optimizer with Apache Calcite | *Java*

- Developed a query optimizer using Apache Calcite to enhance SQL query execution efficiency with logical and cost-based optimization techniques
- Benchmarked performance improvements by testing various query execution strategies using TPC-H

File-Caching Proxy | *Java, C*

- Created a proxy for concurrent remote file access (read/write), integrating whole-file caching to boost performance in challenging network environments and enforced LRU eviction for optimized cache management

TECHNICAL SKILLS

Languages: Python, Java, C, C++, SQL, Scala, Javascript
Tools & Frameworks: Spark, HDFS (Hadoop), Apache Calcite, React.js, Java RMI, HTML/CSS, Git