Rachel (Hao) Tan

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Education

University of Pennsylvania   08/2022 – **05/2025**
MSc, Computer and Information Technology - GPA: 3.7/4.0   Philadelphia, PA
- Teaching Assistant: CIT590 Programming Languages and Techniques (Python & Java)
- Awards: Winner @ Penn Computer Science Hackathon 2024, Best Hack @ FemmeHack 2024

Duke University / Duke Kunshan University   08/2018 – 05/2022
BA, Interdisciplinary Studies (World History & Global Cultural Studies) - GPA: 3.7/4.0   Durham, NC / Kunshan, China

Technical Skills

- **Programming Languages**: Python, Java, C/C++, C#, JavaScript/TypeScript, Swift (iOS development), SQL, R
- **Cloud Services & Web Development**: AWS, Azure, Google Cloud, React, Express, Node.js, Next.js, Spring Boot, FastAPI
- **Database & Data Analysis**: MongoDB, MySQL, PostgreSQL, numpy/pandas, Tableau, Power BI, PyTorch, TensorFlow
- **DevOps**: Git, Docker, Kubernetes, Terraform, Jenkins, CI/CD, npm/yarn, Redis, Kafka, Celery, Jira, Gradle, Figma

Work Experience

Deloitte Digital   06/2024 – 08/2024
GenAI Software Engineer Intern
- Developed an enterprise-scale **RAG** system with custom knowledge bases, helping **400k** colleagues quickly retrieve legal and tax documents through real-time natural language queries, enhancing decision-making and operational efficiency. Engineered back-end services using **Java**, **Python**, **MySQL**, **Elasticsearch**, and **Milvus** to support data retrieval.
- Built customized **AI agent platform** products for clients like BMW and Marriott, integrating **LLMs** via **OpenAI API** and **LangChain** to enhance customer engagement. Implemented front-end interfaces with **Next.js** and **TypeScript**.
- Implemented real-time monitoring and automated recovery systems on **Linux** servers using **Grafana**, **Prometheus**, **Ansible**, and **Bash** scripts, to oversee critical dependencies like **Redis** and **Nacos**, reducing system downtime by **25%**.
- Wrote Python scripts to analyze model metrics, assisting the algorithm team in optimizing token generation speed by **30%**.

Liberty Mutual   01/2024 – 05/2024
Full-Stack Software Engineer Intern
- Developed a secure full-stack internal approval system using **React.js** for the frontend, **Spring Boot** for the backend, and **PostgreSQL** for the database, eliminating data leakage risks by replacing the original third-party tool.
- Enhanced the privacy data masking system with **Natural Language Processing** (NLP) by implementing Named Entity Recognition (NER) model to label unstructured natural language data, ensuring compliance with legal standards.
- Collaborated with Data Scientists in an **Agile** environment, building 10+ **REST APIs** to integrate machine learning models (dog face recognition) for automating fraud detection in pet insurance claims, cutting pet verification labor costs by **63%**.

The Wharton School   06/2023 – 12/2023
Software Development Engineer, part-time
- Applied topic modeling and sentiment analysis to 40,000+ digital archive corpus entries, examining the representation of women in 20th-century media. Published research paper in Tsinghua University *Digital Humanities* journal (2024, vol. 1).
- Collaborated with cross-functional teams to improve the **accessibility** of digital cultural heritage at the Penn Museum for the public. Built data pipelines using **SQL scripts** to automate the digitization of artifacts into the museum database and implemented **test automation** with **Selenium** and **Mockito**, reducing manual workflows by 50%.

Selected Projects

Full-Stack OpenAI Image Generation App - *Express.js | React.js | Node.js | Tailwind CSS | DALL·E API*   **DEMO**
- Developed a full-stack MERN application that generates images from text inputs using OpenAI's DALL-E model, enabling users to create unique visuals quickly. Implemented image storage with Cloudinary for efficient cloud data management.

RaccoonTV: Netflix Movie App Clone - *React.js | Redux Toolkit | Material-UI | AI Voice Assistant*   **DEMO**
- Built a Netflix-inspired React app with real-time data queried from external database via API calls, featuring user authentication, profile management, browsing by category, and AI voice-controlled navigation for hands-free interaction.