Ya-Wei (Jeremy) Tsai

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EDUCATION

The University of Chicago — Chicago, IL
M.S. in Computer Science — December. 2024 (Expected)
- Specialized in Cloud Computing, Machine Learning, Data Analytics, and Distributed Systems

National Taiwan University (NTU) — Taipei, Taiwan
B.A. in Political Science and Double Major in Economics — January. 2022
- Concentrated in Statistics, Econometrics, and Machine Learning.
- Machine Learning coursework included Natural Language Processing (NLP), Deep Learning, CNNs, Self-Attention mechanisms, Transformer models, GANs, Generative AI.

Lund University (LU) — Lund, Sweden
Exchange Program in Social Science — January. 2022

PROFESSIONAL EXPERIENCE

P.LEAGUE+ (Taiwan Professional Basketball League) — Taipei, Taiwan
Data Analyst — September. 2022- July. 2023
- Orchestrated the development of comprehensive player and referee datasets employing Synergy Stats and Python, yielding pivotal insights for tactical and strategic decision-making by teams, league authorities, and media representatives.
- Executed sophisticated **K-means clustering** to analyze player performance metrics and team dynamics; utilized Streamlit to create interactive visualizations, enhancing stakeholder understanding and engagement, and applied Excel for systematic data management, supporting nuanced analytical narratives.
- Conducted behavioral data analysis to distill customer trends and preferences, utilizing Python for data manipulation and Excel for **data visualization**, thereby informing customer engagement strategies and operational enhancements.
- Designed and managed a robust **data pipeline** using Python to streamline the aggregation and preprocessing of complex datasets, leading to a more efficient workflow and timely insights for strategic initiatives.

PROJECT / ACADEMIC / RESEARCH EXPERIENCE

Buy Earth a Coffee Application — Chicago, IL
March. 2024- Present. 2024
- Developed a full-stack application using **Next.js** to enable user profile management and facilitate **cryptocurrency** donations.
- Implemented back-end functionalities in **Node.js** with **MongoDB** for data management, using **Mongoose** for database schema creation and data interaction.
- Integrated **AWS S3** for file storage, handling file uploads and secure storage with public access configurations.
- Configured secure user authentication and session management using **Next-Auth**, enhancing application security and user experience.
- Employed **Axios** for **HTTP** requests to external payment gateway **Cryptomus** to process cryptocurrency transactions.
- Utilized **React** for front-end development, enhancing UI with custom components and managing state with hooks.

NuGraph: a Graph Neural Network (GNN) for neutrino physics event reconstruction (Partnering with Fermi Lab) — Chicago, IL
March. 2024- Present. 2024
- Advanced NuGraph3 **GNN** architecture, optimizing **data aggregation** and **message-passing** for enhanced event-level predictions.
- Implemented a **sawtooth mechanism** for sequential node embedding updates, refining model accuracy and performance.
- Applied **residual connections** in NuGraph3, boosting robustness and feature refinement across iterative message-passing.
- Streamlined **data pipelines** with Python, enabling efficient data handling and supporting advanced analytical capabilities.

Genomic Annotations Service — Chicago, IL
January. 2024- March. 2024
- Led the design and development of a Genomic Annotations Service, a web service for gene data analysis utilizing **Flask**, **Globus**, and **AWS** cloud technologies including **S3, EC2**, **SQS/SNS**, **DynamoDB**, **Lambda**, and **Step Machines**.
- Built **RESTful APIs** with JavaScript and Python, managing data workflows and service integration to provide a robust user experience.

Generative AI Idea Validator for Circular Economy — Chicago, IL
January. 2024- January. 2024
- Pioneered the design and deployment of a cutting-edge AI-driven validation tool using **OpenAI GPT-4** to analyze and categorize concepts within the circular economy sector. The tool is engineered to autonomously produce detailed reports that evaluate the sustainability, commercial potential, and innovative aspects of new ideas.
- Integrated **Retrieval-Augmented Generation (RAG)** with GPT-4 to enhance the AI's ability to fuse retrieved information with generated content, ensuring the production of highly accurate and contextually relevant sustainability assessments.

SKILLS

Technical Languages: Python, Java, C++, C, HTML, JavaScript, TypeScript, Swift, SQL, Stata, R

Developer Tools: Git, Docker, Slurm, MongoDB, AWS, PyTorch, Tensorflow, Sklearn, Scipy, Tableau, Django, Node.js, React Native, Next.js, Flask

Languages: Chinese, English