YUFAN ZHANG

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EDUCATION

Cornell Tech (Cornell University), New York, NY — Aug 2023 – May 2025
M.S. in Information Systems | GPA: 4.0/4.0 | Merit Scholarship Recipient
- Relevant Coursework: Machine Learning Engineering, Natural Language Processing, Computer Vision, Data Science at Scale

Duke University / Duke Kunshan University, Suzhou, China — Aug 2019 – May 2023
B.S. in Data Science | GPA: 3.7/4.0 | Dean's Lists
- Relevant Coursework: Principles of Machine Learning, Data Analysis, Cloud Computing, Databases, Probability and Statistics

TECHNICAL SKILLS

Coding Languages:	Python, SQL, HTML/CSS/JavaScript, Matlab
Machine Learning & AI:	PyTorch, PyTorch Lightning, TensorFlow, Keras, Scikit-Learn, HuggingFace, OpenCV, NLTK
Data Handling & Analysis:	Pandas, NumPy, Spark, Matplotlib, Plotly, Tableau, PowerBI
Miscellaneous Skills:	Git, Docker, Jupyter Notebooks, AWS, Azure, GCP, Linux, Firebase, Kubernetes, Jira

EXPERIENCE

eBay | Product Manager Intern, Cloud Data & Storage Team, Shanghai, China — Mar 2023 – Jun 2023
- Leveraged the knowledge of cloud computing, including **Apache Kafka** and **Flink**, to achieve feature extensions and performance optimization of eBay's internal data streaming platform, *Rheos*, resulting in **10** new use case onboardings and a **13%** user satisfaction score improvement.
- Conducted data analysis and visualization with **PowerBI** on user feedback surveys, deriving actionable insights for the engineering team, which resulted in the platform's integration of **4** new data storage connectors, significantly enhancing the platform's data accessibility.
- Executed in-depth technical research to support the platform's deployment design of Kafka for high availability across data centers, which has supported **100+** clusters across **3** data centers and processed over a **trillion** data streams daily.

Duke Kunshan University | Research Assistant, Suzhou, China — Jul 2022 – Nov 2022
- Leveraged **Python**, **NetworkX** and **Pandas** to build **2000+** daily transaction networks, extracting key graph features and detecting graph core-periphery with cpnet library, which unveiled the decline in inclusiveness in **4** major DeFi banks.
- Developed and optimized **SQL** scripts to extract **over 2 million** Ethereum transaction records on **Google BigQuery**.
- Visualized and presented key metrics' temporal trends with **Plotly** to Liquity's founder, influencing their strategy of DeFi protocol designs.
- **First-authored** a research paper for this cross-sectional comparative study framework on DeFi banks; received **16 citations**. [Paper] [GitHub]

PROJECTS

Text-to-SQL Translation with Modern Natural Language Processing (NLP) Practices, (Python, PyTorch) [GitHub] Spring 2024
- Experimented with various NLP techniques for translating natural language instructions into SQL queries using **PyTorch**, including prompt engineering with a large language model (**LLM**), training language models, and fine-tuning pre-trained language models.
- Fine-tuned a pre-trained T5 language model using **Hugging Face** libraries, achieving the best F1 score of **0.627** over other approaches.
- Implemented various prompt engineering techniques for LLMs, experimenting with **zero-shot** and **few-shot prompting**, demonstrating that the best prompt design improved F1 score by **37.3%** compared to the baseline prompting method.
- Performed comprehensive qualitative error analysis to identify common issues such as syntax and logic errors.

Data-drive Restaurant Recommendation System for Yelp, (Python, Spark) [GitHub] Spring 2024
- Engineered restaurant recommendation systems with **PySpark**, achieving an RMSE of **1.081** using a hybrid recommendation approach, which is a **13.5%** improvement over the content-based filtering approach and a **51.7%** improvement over the ALS-based collaborative filtering method.
- Conducted data cleaning and **feature engineering** on 2 million users and 150,000 businesses data with **Python** and **Pandas**, including scaling numerical attributes, one-hot encoding for categorical attributes, and ordinal encoding with custom scoring functions.
- Experimented with various types of hybrid recommendation systems, identifying ridge regression with feature combination as the optimal model with an R^2 of **0.396** over ensemble methods and other predictive machine learning algorithms (e.g., linear regression, random forest regression).

miniTorch: Python Re-implementation of the PyTorch API, (Python) [GitHub] Fall 2023
- Engineered a **Python**-based alternative library to the **Torch** API, resulting in **100%** compatibility with native **PyTorch** code.
- Architected a custom Tensor data structure pivotal for deep learning model training and evaluation, supporting tensor backend operations including **broadcasting**, mathematical operation **overloads**, **auto-differentiation**, and **backpropagation**.
- Achieved a **10x** speedup in training by implementing parallel computations with **Numba JIT** for essential tensor operations (map, zip & reduce).
- Optimized matrix multiplication for GPU with **Numba CUDA**, achieving a **3x** speedup compared to the CPU optimization.

GAN-based Font Image Style Transfer, (Python, PyTorch) [Paper] [GitHub] Summer 2022
- Designed an end-to-end **GAN**-based generative model with **PyTorch**, tackling the challenge of cross-language font style transfer.
- Adopted the **self-attention** mechanism in the image style encoder to capture both the local and global font style and an adaptive **skip connection** mechanism to improve content fidelity, evidenced by a **14%** and **12%** improvement in SSIM respectively through **ablation studies**.
- Conducted extensive experiments on a multilingual dataset, demonstrating the model's superior performance in generating stylized fonts for unseen languages with quantitative evaluations showing **17.3%** SSIM and **27.4%** mFID improvement over the previous SOTA models.
- **First-authored** a research paper at the top multimedia computing conference, **ACM Multimedia 2022**; received **5 citations**.