Yeshuai Cui

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CAREER

Citi **London, Unitied Kingdom**

Machine Learning Engineer 08/2024-

- **Developed a unified issue description pipeline**: using Q&A-driven prompt engineering to generate and uplift low-quality content.
- **Implemented a multi-stage classification approach**: enuerating and raning categories with justifications to reduce hallucinations.
- **Created a short-text clustering solution**: combining embeddings, TF-IDF, and a custom distance metric for robust thematic grouping.
- **Built a PnP-Based validation system**: extracting relevant PnP sections and providing clear justifications to ensure compliance.

Full Stack Software Engineer 09/2023-08/2024

- **BE Engineer**: Implemented **RestAPI** Endpoints using **Java SpringBoot** and **JDBC**, implemented **Oracle SQL** Consumption layer **tables** & **Materialized Views** for data query. Primarily developed the **distributed caching layer** using **Couchbase**, including custom solutions for data refreshing, eviction, and concurrency control to efficiently handle parallel database read/write operations. This improves response time by 10x. Introduced Key Design Decisions to ensure **time consistency** across FE & BE.
- **FE Engineer**: Implemented webpage components using **React**, handling **data fetching** / data mocking, **state management** of highly correlated states. Optimized development and testing efficiency by **encapsulating** common utility code, reducing redundancy by 5x.
- **QA Tester**: Conducted **functional Testing** as per **JIRA** story description/user story. Leveraged **Excel** to cross validate calculation logic, identifying overlooked scenarios and collaborating with business analysts and product owners to refine specifications for KPI consistency.

EDUCATION

Imperial College London **London, United Kingdom**

MSc Advanced Computing, Distinction 09/2022 – 09/2023

King's College London **London, United Kingdom**

BSc Computer Science, First-Class Honours 09/2019 – 06/2022

Pennon Education **Shandong, China**

A-level 09/2016 – 06/2019

Courses: Maths: A*, Further Maths: A*, Physics: A*. Each single unit passed with at least 90%.

EXTRACURRICULAR EXPERIENCE

Microsoft **Suzhou, China**

Software Engineer Intern, Bing 06/2021 – 09/2021

- Conducted **data processing/feature analysis** using Aether pipeline, wrote Scope(**SQL**-like) and **C#** code to extract time information from data source in order to calculate document ages then calculate the distribution of document ages in time buckets.
- Simulated the scorecard offline and created modules that calculates CTR and similar metrics of fresh documents.
- Evaluated MEB model and revealed it was not fresh-fair, the model biased against more recent documents and documents came from fresh tier.
- **Trained the model** to give even scores for documents from different time and discovered possible reason for the tier gap: feature coverage difference across tiers.

Google
Google Summer of Code, Cloud Native Computing Foundation 06/2021 – 09/2021

- Joined and contributed to **KubeVela**, a modern application platform that makes it easier and faster to deliver and manage applications across hybrid, **multi-cloud** environments.
- Contribution mainly revolved around **Rollout Controller**, which was used in Rollout Plan and Rollout Traits (canary update).

PROJECTS

Load-Aware L4 Load Balancing for Microservices and Cloud Native Systems:
C, Golang, eBPF, Linux, Networking, Kubernetes, bash
Utilized Cilium CNI/eBPF and Kubernetes Service abstraction to develop a centralized L4 Load Balancer, preventing IO bottlenecks. Idea: https://marioskogias.github.io/docs/crab.pdf

Processing & Classification of Provenance On Spark(link):
Python, Data Processing, Machine Learning
Built a **PySpark** pipeline to generate provenance types from provenance graphs and aggregate them into **feature vectors**. Trained **ML** models to classify these graphs and identified the most influential provenance types for improved **model interpretation**.

Deep Learning Projects: **Python, Pytorch, LLM, Text Generation, Computer Vision**
Developed DCGAN, VAE generative models using Pytorch. (link)
Performed age regression from Brain MRI using segmentation, volume feature, and regression / CNN. (link)
Developed discriminative language classifiers using BoW, DeBERTa-Base, and BERT. Improved performance through keyword pre-processing and ensemble methods (Bagging, Voting). (link)
Implemented DP, MC, TD agents for a maze environment, and DQN/DDQN agents for pole balancing in reinforcement learning. (link)

A.I.D. Application for Intervening Depression: **Mobile App, Flutter/Dart, MongoDB**
Delivered a mobile app developed for patients, an admin webpage for data collection and training item set modification, and utilized MongoDB for data analysis and collection.

SKILLS

Languages: English (fluent), Chinese mandarin (native)
Programming Languages: Python, Java, C++, C, Go, C#, Ruby, Haskell, Scala, SQL, HTML, JavaScript
Skills: Software Development, Database Systems, Distributed Systems, Artificial Intelligence

Courses (MSc):

- Computational Finance: Brownian motion, Option pricing, Black and Scholes model, Futures.
- Scalable System and Data: BigTable, Dynamo, Spanner, Spark, Memory indexing, Zookeeper.
- Reinforcement Learning: Markov Process, Bellman Optimality, TD, Q-Learning, DQN.
- Scheduling and Resource Alloc: Moore-Hodgson, Muntz-Coffman, Potential Games, Auctions.
- Deep Learning: GoogLeNet, ResNet, VAE, GAN, RNN, Attention, Diffusion
- Machine Learning for Imaging: Registration, YOLO, Atlas, Federated learning, Interpretability
- Natural Language Processing: Encoding, RNN, LSTM, AutoEncoder, Transformer, Bert, GPT
- Cryptographic Engineering: Perfect Secrecy, HASH, MAC, Commitment. 0 knowledge proof

Courses (BSc Selective):

- Optimization Methods: LP, Shortest Path, Convex Optimization, (Projected) Gradient Descent
- Programming practice and Application: Java, OOP, Design Patterns
- Database Systems: Relational Algebra, Buffer Pool, Query Execution, Lock/Latches.
- Internet Systems: HTTP, HTML, TCP/IP, TLS, JavaScript, REST.
- Operating Systems and Concurrency: Locks, Semaphore, Virtual Memory, Paging, Concurrency.
- Machine Learning: Decision Tree, K-means, OLS / ridge / lasso, SVM, Evo Algos, Neural Nets..