Yeshuai Cui

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CAREER

Citi **London, Unitied Kingdom**

Software Engineer 09/2023-

- **BE Engineer**: Implemented **RestAPI** Endpoints using **Java SpringBoot** and **JDBC**, implemented **Oracle SQL** Consumption layer **tables** & **MVWs** for data querying. And 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 KDDs to ensure **time consistency** across FE & BE.
- FE Engineer: Implemented webpage components using **React**. Implemented **data fetching** / data mocking, **state management**, and complex logic for highly correlated states. Managed the lifecycle of underlying and displaying states, extracted and encapsulated common utility code to reduce duplicated development/testing efforts by 5x.
- QA Tester: Conducted **functional Testing** as per **JIRA** story description/user story. Leveraged **Excel** to cross validate calculation logic, identifying gaps due to prior negligence of scenarios in the user stories. Collaborated with BAs and POs to refine specifications and enable unified calculations across KPIs.

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, Arbitrage, Option pricing, Black and Scholes model.
- Scalable System and Data: BigTable, Dynamo, Spanner, Spark, Memory indexing, Zookeeper.
- Reinforcement Learning: Markov Process, Bellman Optimality, TD, Q-Learning, DQN.
- Computer Vision: Harris Corner Detector, SIFT, Epipolar Geometry, Optical Flow.
- 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):

- Programming practice and Application: Java, OOP, Design Patterns
- Computer Systems: Cache, Pipeline, Assembly Language (MIPS), Computer Architecture.
- Database Systems: Relational Algebra, Buffer Pool, Query Execution, Lock/Latches.
- Data Structure: Heap, Array, Stack, Queue, Sorting Algorithms.
- 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, linear regression, SVM, Evo Algos, Neural Nets.
- Optimization Methods: LP, Shortest Path, Convex Optimization, (Projected) Gradient Descent.
- Cryptography: DES, public-key cryptosystems, RSA, Diffie-Hellman key exchange.