

# Qi Xiang

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## EDUCATION

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### Imperial College London

*Sep 2024 - Present*

- MSc Environmental Data Science and Machine Learning
- Relevant Courses: Deep Learning, Big Data Analytics, Data Science and Machine Learning

### The University of Manchester

*Sep 2021 - Jul 2024*

- BSc Computer Science - First Class Honours
- Relevant Courses: Data Science, Machine Learning, Natural Language Processing, Computer Vision

## INTERNSHIP EXPERIENCE

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### Zilliz

*July 2024 - September 2024*

*Marketing Intern (Research)*

- Conducted research on vector indexing methods, including HNSW and IVF variants; prepared comparison materials highlighting their trade-offs in different retrieval scenarios.
- Studied the architecture and design principles of Milvus, focusing on its vector indexing engine, storage layer, and scalability mechanisms; summarised findings for use in a public-facing technical course.
- Supported SEO colleagues by formatting and standardising data to improve Milvus's visibility in search engine results and large language model outputs.

### MCM China

*July 2023 - August 2023*

*Information Technology Intern*

- Developed an automated financial reporting system integrated with Power BI for enhanced efficiency in financial data analysis.
- Designed and implemented a modular ETL pipeline to automate data extraction, cleaning, transformation, and loading, ensuring stable and efficient data processing.
- Created multi-dimensional visualizations in Power BI for trend analysis, variance comparison, and forecasting, supporting strategic decision-making for management.

## RESEARCH EXPERIENCE

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### Research Project: Learnable Agent for Video Game Playing (Deep Reinforcement Learning)

*August 2023 - May 2024   GitHub: <https://github.com/Aubur9y/Learnable-Agent-for-Sekiro>*

- Developed an autonomous agent with PyTorch capable of mastering video games using deep reinforcement learning.
- Researched, implemented, and optimized cutting-edge algorithms, including Deep Q-Networks (DQN), Dueling DQN, and Proximal Policy Optimization (PPO), optimizing performance by incorporating an entropy term into PPO's loss function to enhance exploration and mitigate premature convergence.
- Integrated Convolutional Neural Networks (CNNs) with custom architecture layers, leveraging frame-skipping techniques to minimize data redundancy, accelerate training processes, and facilitate real-time strategic decision-making, significantly improving gameplay performance.

- Architected a customized testbed environment from scratch, enabling comprehensive benchmarking and rigorous evaluation of reinforcement learning algorithms for continuous performance optimization.
- Engineered a robust reward mechanism, incorporating techniques like reward shaping, discount factors, and entropy-based loss functions, increasing learning efficiency by 45% and delivering more robust, adaptive gameplay strategies.

## PROJECT EXPERIENCE

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### Food Ordering Platform

*Github: <https://github.com/Aubur9y/sky-take-out>*

- Developed a full-stack food ordering system using Spring Boot, MyBatis, Redis, and JWT, supporting both admin and client portals for ordering, payments, and order tracking.
- Optimised query latency from 127ms to 23ms by integrating Redis for data caching and implementing cache penetration and breakdown prevention strategies.
- Ensured data consistency using delayed double-delete strategies and proactive cache updates.
- Secured user sessions with JWT and optimised permission checks using ThreadLocal to reduce overhead.
- Deployed Nginx as a reverse proxy and load balancer; used WebSocket to enable real-time order status updates.

### Personalized Product Recommendation System

*GitHub: <https://github.com/Aubur9y/Personalised-Product-Recommendation-System>*

- Integrated raw product data and performed feature engineering to construct key attributes (e.g., discounted price, ratings, user engagement, product categories), effectively capturing product characteristics and user preferences while addressing data inconsistency and redundancy.
- Built a content-based filtering model using cosine similarity and nearest-neighbor search on standardized product features, enabling accurate item matching and overcoming limitations of single-method recommendations.
- Developed a collaborative filtering model based on user-item interaction data, using efficient indexing to identify similar users and mitigate data sparsity and cold-start issues. Combined dynamic weighting and category diversity penalties to create a personalized hybrid recommendation system, aimed at significantly improving user conversion rates and overall platform engagement.

### Flood Risk Prediction

- Conducted exploratory data analysis (EDA) and designed two key data processing pipelines to ensure efficient and reliable data preprocessing.
- Developed and trained multiple machine learning models, including Random Forest Classifier and XGBoost; conducted performance comparisons and utilized RandomizedSearchCV for hyperparameter tuning to improve model accuracy and generalization.
- Led code integration efforts, consolidating independently developed modules from an 8-member team into a clean, modular, and well-structured codebase that adhered to project standards and enhanced maintainability.

## SKILLS

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- **Programming Languages:** Python, Java, SQL
- **Machine Learning:** PyTorch, Pandas, NumPy, Scikit-learn, LightGBM, GBDT, Logistic Regression, FM, DIN, CNN, DQN, PPO
- **Data Visualisation:** Power BI, Matplotlib, Seaborn
- **Java Web Development:** SSM framework (Spring, Spring MVC, MyBatis), Spring Boot, Maven, MySQL, Redis
- **DevOps & Tools:** Docker, GitHub