

ZIRUI LI

A Computer Science Student

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Manchester, UK

EDUCATION

University of Manchester

M.Eng. in Computer Science (2:1 degree)

Sept 2021 – June 2025

Manchester, United Kingdom

Natural Language Understanding

Database design

Software engineering

Game theory

Algorithms

Python

Pytorch

Java

LaTeX

JavaScript

Linux

SQL

HTML

Flask

Django

EXPERIENCE

Research intern

University of Manchester

June 2024 – Present

- Participated in the research project DocMMIR: A Framework for Document Multi-modal Information Retrieval, aiming to benchmark information retrieval tasks on current multi-modal models.
- Led the design and implementation of the retrieval pipeline using PyTorch lightning and fine-tuned and tested on various multimodal models, for example, CLIP, BLIP2 and SIGLIP. Collected, pre-processed, and organized a dataset of around 300000 Wikipedia pages combining text and images.
- Trained models using custom fusion techniques for combining text and image embedding as document embeddings. Then utilizing contrastive loss to map query embeddings to the document embeddings.
- Preparing the manuscript for publication, hopefully, has the potential to go public by summer 2025.

Full-Stack Engineer Intern

AutoBizLine Inc.

Aug 2023 – Sep 2024

- Actively facilitated in the full-stack development of "MySecondLine", an online communication application, leveraging Django and JavaScript for both server-side logic and client-side interaction enhancements. Collaborated with a team of 5 engineers, contributing to over 8000 lines of code.
- Streamlined the regulation reviewing process within the application's administrative panel by designing and implementing a Django-based workflow automation. This reduced manual review time and increased operational efficiency by automating regulation compliance checks.
- Solely integrated a comprehensive taxation module into the existing Django checkout flow, enabling automatic tax calculations based on user location and applicable tax laws. This included API development and UI integration. Conducted 200+ automated and manual tests to validate correctness across different taxation scenarios.

PROJECTS

Third Year project

Social network analysis

Sep 2023 – Apr 2024

- Designed and implemented a Social Network Analysis project to interpret and visualize complex social interactions with up to 15000 nodes using the Python library NetworkX, focusing on centrality measures to evaluate the importance of nodes in a network. Created visualizations of social networks using libraries such as NetworkX enhancing the interpretability of complex network structures and relationships.
- Implemented and evaluated various link prediction algorithms, ranging from traditional metric-based methods (such as Common Neighbors, and Jaccard Coefficient) to advanced state-of-the-art machine learning - Graph Autoencoder (GAE) and node2vec. Demonstrated the ability to learn and deploy new areas from scratch.

University Coursework

Eventlite

Jan 2023 – Apr 2023

- Eventlite is a web application built based on the Springboot framework, that helps people organize and manage their events
- Incorporated the MVC framework and Conducted testing for user registration, event creation and event editing.