Yizhao Chen

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EDUCATION

Northeastern University Software College Shenyang, China
B.Eng. in Software Engineering (Artificial Intelligence Track) 09/2020-06/2024

- GPA: 3.93/4.00, 91.4/100, Top 3%
- Honors: Academic Excellence Award 10/2023 (Top 1%); Excellent Student Cadre Model 10/2022 (Top 1%); Outstanding Student 10/2021 (Top 5%); Second Class Scholarship 10/2021 (Top 10%).

North Carolina State University Raleigh, NC
Summer Research Program 07-08/2022

ACADEMIC PROJECTS

Diversity-enhanced Conversational Recommendation with Multi-agent Reinforcement Learning
Research Assistant, Advisor: Prof. Fen Shi - Northeastern University (China) 05/2023-Present

- Designed a diversity-enhanced conversational recommendation framework (DECREC), which involves a collaborative approach that incorporates multiple agents in the action-selecting process, rather than having actions dominated by a single value network;
- Integrated feature entropy into the calculation of action values for query features, promoting a more comprehensive range of diverse queries;
- Optimized the dynamically calibrated experience playback method, adjusting the frequency of long-tail data and head data to ensure continuous attention to the former;
- Conducted testing on four datasets, including Yelp and LastFM, and observed a significant improvement of over 15% in evaluation metrics such as SR@15, AT, and HDCG, while enhancing recommendation diversity and mitigating the issues related to the long-tail distribution of data;
- Co-authored the paper titled "Diversity-enhanced Conversational Recommendation with Multi-agent Reinforcement Learning" for submission to the top-tier database conference ICDE.

PICA: Unleashing The Emotional Power of Large Language Model 12/2022-07/2023
Team Member (Four-person team), Advisor: Prof. Fen Shi - Northeastern University (China)

- Collaborated in the creation and refinement of PICA, a large-scale empathetic dialogue AI model, which was developed by training on a high-quality dataset of 2k using Prompt Tuning techniques, based on ChatGLM2-6B;
- Designed diverse, high-quality emotion-focused dialogue datasets (around 1,000 examples) using COT-inspired self-chat strategies for ChatGPT;
- Demonstrated over a 10% improvement in consistency and empathy metrics compared to ChatGLM2-6B and Soulchat models after testing.

The Optimized Probabilistic Recommendation Model in Exposure Bias Online
CIS Project (A+), Published as first author in CONF-SPML conference (ISSN: 2755-2721) 07/2022-03/2023
Advisor: Prof. David P. Woodruff - Carnegie Mellon University

- Developed an ExpoMF++ model to address exposure bias in recommendation systems, employing causal analysis to establish a foundation for the exposure bias problem and hierarchical modeling to create an improved algorithmic structure for the original ExpoMF model;
- Replaced the basic sigmoid function model with a neural collaborative filtering framework and optimized it using a Gaussian mixture model.
- Validated the model's performance on the Gowalla and TPS datasets, achieving approximately 30% improvement over the original model in both Recall@k and NDCG@k evaluations.

Development of Intelligent Earthquake Classification & Magnitude Regression System
Team Member, Advisor: Prof. Tao Ren - Northeastern University (China) 12/2022-03/2023

- Developed a network using DenseBlock and Multi-Head Attention, addressing data imbalance issues in seismic event classification, and incorporated epicentral distance as a feature;
- Gathered seismic waveform data from Kafka and actively participated in the localization of seismic events using the Seiscomp3-based LocSAT algorithm;
- Prepared the dataset by applying ten polynomial fits, detrending, and normalization. The seismic data was transformed into a three-dimensional format, and a convolutional neural network was implemented using TensorFlow for classifying seismic events based on cumulative weight comparisons;

- Achieved a seismic magnitude prediction accuracy of 90.26%. This model is set to be deployed at the China Earthquake Networks Center (CENC) as a valuable auxiliary tool for earthquake early warning systems.

Predicting Regime Switching in Capital Markets from Economic Trends Online
Team Leader, Advisor: Prof. Hien Tran - North Carolina State University 07-12/2022

- Utilized machining learning methods to analyze market volatility changes based on economic data collected from Fred ranging from interest rates, inflation, and GDP, and evaluated the performance of different models through accuracy, cross-validation, etc.;
- Applied PCA and DBSCAN to analyze S&P 500 data and visualize the performance of financial instruments in markets with low, medium, and high volatility, considering the influence of diverse economic variables;
- Employed hybrid machine learning algorithms along with time-series analysis, using Gaussian Markov models and AutoRegressive models to detect and explain regime switches in the Bitcoin market.

INTERNSHIPS

NEUSOFT CORPORATION Co., Ltd. Shenyang, China
Intern of Systems Development 05-07/2023

- Co-worked with the team to develop an AI-powered software system for managing and tracking logistics and distribution operations, responsible for designing and implementing the Customer Service Center module;
- Innovatively integrated a "Knowledge-Based Q&A System" into the Customer Service Center module trained by NLP, enabling the creation of an intelligent chatbot that operates while safeguarding company privacy;
- Employed Vue3 and Bootstrap component library with Streamlit to design user-friendly interfaces that enhanced user experience, meanwhile establishing a robust proxy between frontend and backend using Nginx to improve system stability and responsiveness;
- Integrated Flink into Spring Boot using a thread pool for non-blocking operation and used it for processing message stream data, Neo4j for recommendation data, and JSoup for web scraping.

Intern of Systems Development 06-07/2021

- Involved in the development of a university satisfaction survey system, using HTML, CSS, JavaScript, and Bootstrap for creating the user interface, applying Maven for version control, and employing MySQL for the database with visualization using Navicat;
- Built web APIs using Java Spring Boot for the backend, connected them to the Vue frontend, managed service messages with Nacos for load balancing, and set up databases for each microservice architecture.

Shenyang Zhehang Information and Technology Co., Ltd. Shenyang, China
Back-end Development Engineer 05-07/2022

- Developed an internal short link service handling up to 30 million conversions and millions of redirects monthly;
- Ensured one-way, uniformly distributed, and conflict-free short links by utilizing the MurmurHash+Base62 algorithm for address conversion;
- Managed data volume challenges by setting expiration times for Redis and employing a combination of lazy deletion and scheduled deletion in the database, with task scheduling distributed using XXL-JOB;
- Utilized the UidGenerator for creating unique IDs, optimizing the performance of long-to-short link conversion, and employing ShardingSphere for database sharding and table partitioning to improve database availability.

LEADERSHIP ON-CAMPUS

Undergraduate Student Development Advisor 09/2021-Present

- Advised the first-year undergraduates on academic and professional development, organized tutoring activities once a week for 39 students, and served as the TA for “Advanced Mathematics” and “Discrete Mathematics”.

Class Monitor & Research Team Leader & Internship Team Leader 09/2020-Present

- Responsible for organizing various student activities, including English competitions and Programming Contests;
- Communicated with teachers and academic advisors to arrange students’ study plans, hosted weekly meetings, and allocated personnel for academic activities.

SKILLS

Language: English (Fluent); Mandarin (Native).
Programming Languages: Proficient in Python, Java, JavaScript, SQL, C, C++, CSS, HTML.
OS: Windows, macOS, Linux, Android, and iOS.