# Li Fan

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## Education

- **Xi'an Jiaotong-Liverpool University** — Suzhou, Jiangsu
  *BSc in Information and Computing Science; GPA: 3.89* — *Sep 2021 - June 2025*

## Skills Summary

- **Languages**: Java, C++, Python (pytorch), C, SQL
- **Tools**: Springboot, GIT, Matlab, XCode

## Experience

- **UNC** — Chapel Hill, NC
  *Remote internship* — *Oct 2023 - Jan 2024*
  - **Geological data prediction**:
    - Led a project in multimodal geoscience analysis, leveraging vision language models to predict small-scale river dynamics.
  - **Hallucination in VLM**:
    - Participated in discovering flaws in SOTA VLMs (GPT-3V/GPT-4V).
- **HKUST-GZ** — Guangzhou, Guangdong
  *Remote internship* — *Aug 2023 - Dec 2023*
  - **Mutli-agent attack on graph**:
    - Led in the problem dealing with social bot detection by safe multi-agent reinforcement learning.
- **XJTLU** — Suxhou, Jiangsu
  *Research Assistant* — *Apr 2023 - Oct 2023*
  - **Recommendation System**:
    - Participated in the project of Personalized Causal Disentanglement for Debiasing Recommendation
    - Led in the project of Cross-market recommendation by meta-learning and graph representation learning
    - Participated in the project of Collaborative filtering in latent space using a Bayesian approach for cold-start music

## Academic Projects

- **Geological data prediction**: I led a project in multimodal geoscience analysis, utilizing vision-language models to accurately predict river flow in segmented areas. This work involved advanced machine learning techniques for nuanced hydrological pattern forecasting, significantly enhancing the understanding and prediction of small-scale river dynamics. (Oct 2023 - Jan 2024)
- **Social bot detection**: Our framework utilizes diffusion models to determine social influence and applies safe reinforcement learning to identify and mitigate the impact of social bots. This approach addresses the social bot detection challenge by prioritising identifying bots with significant influence. (Aug 2023 - Dec 2023)
- **Collaborative filtering in latent space: a Bayesian approach for cold-start music recommendation**: We introduce CFLS, a new method for cold-start music recommendation, utilizing Variational Auto-Encoder (VAE) with a Gaussian process (GP) prior tied to user profiles for collaborative filtering in latent spaces. This approach considers user correlations, enhancing recommendations' accuracy, diversity, and interpretability. Tests on real-world data confirm CFLS's superiority, and visualizations illustrate its diverse, interpretable, and user-tailored outcomes. (Oct 2023 - Nov 2023)
- **Dual prototype attentive graph network for cross-market recommendation**: This work presents the Dual Prototype Attentive Graph Network (DGRE) for improving cross-market recommender systems by integrating market-specific and shared insights. DGRE uses graph-based learning to identify user and item prototypes, capturing shared behaviors and unique market features. (July 2023 - Sep 2023)
- **Personalized Causal Disentanglement for Debiasing Recommendation**: Because of herd mentality, people are more likely to interact with popular items, which leads to increased popularity of the item, resulting in the Matthew effect. Our research aims to overcome the Matthew effect problem caused by popularity bias in the recommendation system, i.e., to extract and remove the item's popularity aspect. (April 2023 - Oct 2023) (Under-reviewed in SIGIR 2024 short paper)

## Publication

- Menglin Kong*, **Li Fan***, Shengze Xu, Xingquan Li, Muzhou Hou, Cong Cao, **Collaborative filtering in latent space: a Bayesian approach for cold-start music recommendation**, in the Proceeding of the 28th Pacific-Asia Conference on Knowledge Discovery and Data Mining (**PAKDD 2024**), May 2024 (**Oral**)

[* means contributed equally to this work]

## Honors and Awards

- University Academic Excellence Award (Top 5%).