

Tianxin Wei

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EDUCATION

University of Science and Technology of China (USTC)

Anhui, China

Bachelor Degree in Computer Science, School of the Gifted Young

Sep. 2016 – Jul. 2020

- Overall GPA: 3.61 / 4.30 (87 / 100); Major GPA: 3.82 / 4.30 (89 / 100)
- Rank: top 10% of 224 students
- Honors: Artificial Intelligence Talent Class
- Core Courses: Operating Systems (95) / Introduction to Artificial Intelligence (95) / Introduction to Algorithms (92) / Fundamentals of Operations Research (96) / Introduction to Pattern Recognition (94)

RESEARCH INTERNSHIPS

- Department of Computer Science, University of California, Los Angeles (UCLA) California, USA
Visiting Scholar in Professor **Wei Wang & Yizhou Sun's** Group Jul. 2019 – Sep. 2019
Project: Graph-based recsys; Automated meta-path discovery
- Department of Electrical & Computer Engineering, University of Texas at Austin (Virtual) Texas, USA
Research Intern in Professor **Zhangyang Wang's** Group Jan. 2020 – Present
Project: Adversarial training method for robustness in NLP; Fintech
- Amazon.com, Inc., Alexa Group Virtual
Remotely Advised by Dr. **Ruirui Li** and **Oguz Elibol** Aug. 2020 – Present
Project: Self-supervision for speaker identification

PUBLICATIONS (* DENOTES EQUAL CONTRIBUTION)

- **Fast Adaptation for Cold-start Collaborative Filtering with Meta-learning** [PDF]
Tianxin Wei, Ziwei Wu, Ruirui Li, Ziniu Hu, Fuli Feng, Xiangnan He, Yizhou Sun, and Wei Wang.
Accepted by the 20th IEEE International Conference on Data Mining (ICDM Full Oral, Accept rate: 9.8%)
- **Unpaired Multimodal Neural Machine Translation via Reinforcement Learning** [PDF]
Yijun Wang*, Tianxin Wei*, Qi Liu, Enhong Chen
Accepted by the 24th International Conference on Database Systems for Advanced Applications (DASFAA Full)
- **Model-Agnostic Counterfactual Reasoning for Eliminating Popularity Bias in Recommender System** [PDF]
Tianxin Wei, Fuli Feng, Jiawei Chen, Chufeng Shi, Ziwei Wu, Jinfeng Yi, Xiangnan He
Submitted to WWW 2021 as the first author (Accept / Weak Accept / Weak Reject before Rebuttal)
- **AR-Stock: Deep Augmented Relational Stock Prediction** [PDF]
Tianxin Wei, Yuning You, Tianlong Chen
Preliminary work presented at AAAI 2021 KDF Workshop (Oral). To be submitted to a major CS conference.
- **Adversarial Self-supervised Learning for Speaker Identification**
Tianxin Wei, Ruirui Li, Oguz Elibol
Submitted to NAACL 2021 as the first author

RESEARCH EXPERIENCE

Adviser: Professor Wei Wang & Yizhou Sun | Department of CS | UCLA

Aug. 2019 – Mar. 2020

Project: Fast Adaptation for Cold-start Collaborative Filtering with Meta-learning

- I proposed a novel meta-learning paradigm, named MetaCF, that aims to learn an accurate collaborative filtering model that can be well-generalized for fast adaptations on fresh users with limited interactions;
- I designed a dynamic subgraph sampling method that accounts for the dynamic arrival of fresh users and stabilizes the adaption procedure by optimizing the learning rates for adaption in a fine-grained manner. We also incorporated potential interactions to benefit the collaborative filtering models and alleviate the data sparsity problem;
- Our method has achieved 38.23%, 13.74% and 17.55% improvement over state-of-the-art baselines on Last-FM,

Amazon-Electronics, Amazon-Kindle datasets respectively.

Adviser: Vice Dean Xiangnan He | USTC & Jinfeng Yi | JD AI Research Feb. 2020 – June 2020

Project: Eliminating Popularity Bias in Recommender System via Counterfactual Reasoning

- Recommender systems trained with normal training paradigm have the intrinsic bias towards popular items instead of the personalized suggestions for individual users;
- In this work, I explored the popularity bias issue from a novel and fundamental perspective --- cause-effect. I identified that popularity bias lies in the direct effect from the item node to the ranking score, such that an item's intrinsic property is the cause of mistakenly assigning it a higher ranking score;
- I was the first to formulate the causal graph for recommendation and proposed a model-agnostic counterfactual reasoning framework that trains a recommender model according to the causal graph via a multi-task training schema and performs counterfactual inference to eliminate bias;
- Achieved an average improvement of 197.56% over two representative models MF and LightGCN on five large-scale datasets, which is rather substantial.

Adviser: Professor Zhangyang Wang | Department of ECE | UT-Austin Jan. 2020 – May. 2020

Project: AR-Stock: Deep Augmented Relational Stock Prediction

- I proposed to extend the traditional graph neural network to accurately predict stock trends by leveraging the rich information in the stock knowledge graph;
- I designed a geometric augmentation approach to discover hidden long-range dependencies between stocks.
- Leveraged self-supervised learning to facilitate GCN training and enforce global, local graph structure awareness;
- Achieved an improvement of 48.13% on NASDAQ and NYSE datasets over state-of-the-art models.

Adviser: Professor Qi Liu & Professor Enhong Chen | CS | USTC May. 2019 – Aug. 2019

Project: Unpaired Multimodal Neural Machine Translation via Reinforcement Learning

- Machine translation models faced with the problem of sparse data for a long time. To resolve the problem, I introduced multimodal content, especially image to help build an NMT system without parallel corpora;
- Designed a novel reward function for reinforcement learning based on the image caption model to capture the consistency between the language and images;
- Improved 1.0 - 3.0 BLEU on the Multi30K, IAPR-TC12, and IKEA datasets.

Adviser: Dr. Ruirui Li & Dr. Oguz Elibol | Amazon Alexa June. 2020 – Sep. 2020

Project: Adversarial Self-supervised Learning for Speaker Identification

- I introduced both frame-mask and frequency-mask based self-supervised reconstruction tasks to enhance the training of speaker identification task in the context of multi-task learning;
- Designed adversarial loss to enhance the self-supervised task, improving the identification accuracy.

COMMUNITY SERVICE | AWARDS | PATENTS

- Invited Journal Reviewer: ACM Transactions on Information Systems (TOIS)
- Assistant Reviewer: SIGIR 2020, WWW 2021, TKDE
- Artificial Intelligence Class Honor Award (Top 5% of All)
- Outstanding Students Scholarship for four consecutive years at USTC, 2016 - 2019 (Top 10% of All)
- Outstanding Freshmen Scholarship at USTC, 2016
- Zero Parallel Corpus Multimodal Neural Machine Translation Method | Public Number: CN110245364A
 - Enhong Chen, Qi Liu, Yijun Wang, **Tianxin Wei**
- A Meta-learning Recommendation Method for Cold-start Users | Being Processed
 - Xiangnan He, **Tianxin Wei**, Ziwei Wu, Fuli Feng | Processing Number: 202011271357.5
- Mitigating Popularity Bias in Recommendation System via Causal Inference | Being Processed
 - Xiangnan He, **Tianxin Wei**, Fuli Feng, Jiawei Chen, Jinfeng Yi