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

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 2020 Full Oral, Accept rate: 9.8%**)
- **Unpaired Multimodal Neural Machine Translation via Reinforcement Learning [PDF]**
  Tianxin Wei*,* Yijun Wang*, Qi Liu, Enhong Chen
  Accepted by the 26th International Conf. on Database Systems for Advanced Applications (**DASFAA 2021 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 KDD 2021. (Previously got Accept / Weak Accept / Weak Reject at WWW 2021)
- **Causal Intervention for Leveraging Popularity Bias in Recommendation**
  Yang Zhang, Fuli Feng, Xiangnan He, **Tianxin Wei**, Chonggang Song, Guohui Ling and Yongdong Zhang
  Submitted to SIGIR 2021.
- **AR-Stock: Deep Augmented Relational Stock Prediction [PDF]**
  Tianxin Wei, Yuning You, Tianlong Chen**.**
  Submitted to KDD 2021. (Preliminary work presented at AAAI 2021 KDF Workshop **(Oral)**)
- **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 adaptions 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)
- 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