Zhaoxuan Tan

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Research Interests

My primary research interests lie at the intersection of Natural Language Processing and Graph Mining (particularly Knowledge Graphs and Social Networks), with a particular emphasis on Knowledge Base Reasoning, Knowledge-Enhanced NLP, and Computational (NLP/DM) for Social Good.

Education

Xi'an Jiaotong University, Xi'an, Shaanxi, China (member of the C9 league in China) 2019.08 - present
B.E. in Computer Science and Technology
GPA: 89.05 (+3)/100, top 6% [transcript]
Thesis Advisor: Prof. Minnan Luo

Publications (* indicates equal contribution)

[1] **KRACL: Contrastive Learning with Graph Context Modeling for Sparse Knowledge Graph Completion.**
Zhaoxuan Tan, Zilong Chen, Shangbin Feng, Qingyue Zhang, Qinghua Zheng, Jundong Li, Minnan Luo.
In Proceedings of The Web Conference (WWW), 2023.

[2] **BotPercent: Estimating Twitter Bot Populations from Groups to Crowds.**
Zhaoxuan Tan*, Shangbin Feng*, Melanie Sclar, Herun Wan, Minnan Luo, Yejin Choi, Yulia Tsvetkov
arXiv preprint arXiv:2302.00381, 2023.

[3] **TwiBot-22: Towards Graph-Based Twitter Bot Detection.**
Shangbin Feng*, Zhaoxuan Tan*, Herun Wan*, Ningnan Wang*, Zilong Chen*, Binchi Zhang*, Qinghua Zheng, Wenqian Zhang, Zhenyu Lei, Shujie Yang, Xinshun Feng, Qingyue Zhang, Hongrui Wang, Yuhan Liu, Yuyang Bai, Heng Wang, Zijian Cai, Yanbo Wang, Lijing Zheng, Zihan Ma, Jundong Li, Minnan Luo.
In *Proceedings of the NeurIPS, Datasets and Benchmarks Track, 2022.*

[4] **PAR: Political Actor Representation Learning with Social Context and Expert Knowledge.**
Shangbin Feng, Zhaoxuan Tan, Zilong Chen, Peisheng Yu, Qinghua Zheng, Xiaojun Chang, Minnan Luo.
In *Proceedings of Conference on Empirical Methods in Natural Language Processing (EMNLP), 2022.*

[5] **Heterogeneity-Aware Twitter Bot Detection with Relational Graph Transformers.**
Shangbin Feng, Zhaoxuan Tan, Rui Li, Minnan Luo.
In *Proceedings of AAAI Conference on Artificial Intelligence (AAAI), 2022.*

[6] **KALM: Knowledge-Aware Integration of Local, Document, and Global Contexts for Long Document Understanding.**
Shangbin Feng, Zhaoxuan Tan, Wenqian Zhang, Zhenyu Lei, Yulia Tsvetkov.
arXiv preprint arXiv:2210.04105, 2022.

[7] **AHEAD: A Triple Attention Based Heterogeneous Graph Anomaly Detection Approach.**
Shujie Yang, Binchi Zhang, Shangbin Feng, Zhaoxuan Tan, Qinghua Zheng, Ziqi Liu, Minnan Luo.
arXiv preprint arXiv:2208.08200, 2022.

Research Experience

Research Assistant, TsvetShop @ University of Washington 2022.09 - 2023.01

- Introduced the concept of community-level Twitter bot detection and developed BotPercent, a multi-dataset, multi-model Twitter bot detection pipeline. Utilizing BotPercent, we investigate the presence of bots in various Twitter communities and discovered that bot distribution is heterogeneous in both space and time [2].
- Worked on KALM, a knowledge-aware language model that jointly incorporates external local, document-level, and global context knowledge for long document understanding [6].

Advisor: Prof. Yulia Tsvetkov

Virtual Collaboration, CNM @ National University of Singapore 2022.08 - present

- Seeking to understand how the anthropomorphic features of chatbots affect human-chatbot interactions, user engagement, and user experience.
- Crawled data with Twitter API and applied language models to analyze human-chatbot conversations.

Advisor: Prof. Renwen Zhang

Research Assistant, Knowledge Engineering Group (KEG) @ Tsinghua University 2022.04 - 2022.11

- Worked on kgTransformer v2: Unifying Architecture and Pre-training for Knowledge Graph Reasoning.
- Achieved the state-of-the-art results and significantly outperformed the previous state-of-the-art (NBFNet) by 14.3% on WN18RR and 5.7% on NELL-995..
- Won 4^{th} place in the OGB-LSC@NeurIPS 2022 competition WikiKG90Mv2 track (CogDL-kgTransformer).

Advisor: Prof. Yuxiao Dong

Research Assistant, Luo lab Undergraduate Division (LUD) @ Xi'an Jiaotong University

- **Member**: Worked on graph-based Twitter bot detection, knowledge graph representation learning, political actor representation learning, and heterogeneous graph anomaly detection [7]. 2021.08 - 2022.06
  - Proposed KRACL, addresses the prevalent sparsity issue in knowledge graph completion using KG context and contrastive learning [1].
  - Presented TwiBot-22, the largest graph-based Twitter bot detection benchmark to date, offering diverse entities and relations in the Twittersphere with improved annotation quality [3].
  - Presented the relational graph transformers architecture to capture intrinsic relation heterogeneity and influence heterogeneity for improved Twitter bot detection [5].
  - Proposed a method to learn political actor representations incorporating social context and expert knowledge, and apply these representations to tasks in computational political science [4].
- **Director**: Promoting undergraduate research by leading a 17-person undergraduate group, and mentoring 9 schoolmates alongside the other senior students. 2022.06 - present

Advisor: Prof. Minnan Luo

Summer Workshop, SoC @ National University of Singapore (virtual) 2021.05 - 2021.07

- Attended lectures in AI analytics and IoT and built a Twitter bot detection demo.
- Studied the effect of heterogeneity in social networks.

Advisor: Dr. Lek Hsiang Hui

Honors and Awards

AAAI Student Scholarship, Association for the Advancement of Artificial Intelligence 2022
Scholarship for Outstanding Students, Third Prize, XJTU 2022
National Second Prize, CUMCM 2021
Scholarship for Outstanding Students, Second Prize, XJTU 2021, 2020
Dean's List, XJTU 2020, 2021, 2022

Top Project Runner Up, NUS SoC Summer Workshop 2021
Honorable Mentioned Prize (top 15%), MCM 2021
First Prize in Shaanxi Province, CUMCM 2020

Services

Program Committee Chair, CSUC22@XJTU 2022
Virtual Volunteer, EMNLP 2022
Reviewer for NeurIPS, Datasets and Benchmarks Track 2022
Reviewer for Learning on Graphs Conference 2022
Director of the LUD lab 2022
Web Chair, CSUC21@XJTU 2021

Skills

- Programming Skills: Python, PyTorch, MATLAB, C/C++, bash, HTML/CSS, SQL, LaTeX, Git, ssh
- Language Skills: Mandarin (native), English (TOEFL 107: R 29, L 29, S 22, W 27), Cantonese (native)