Woojeong Jin

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RESEARCH INTERESTS

My research interest lies at the intersection of **multimodal learning**, **natural language processing**, and **machine learning**. I am particularly passionate about advancing *reasoning* and *generalization* abilities in *low-resource* settings across different modalities. By leveraging the power of these fields, I aim to develop innovative approaches that enhance the understanding and processing of multimodal data, ultimately contributing to the development of intelligent systems capable of reasoning and generalizing effectively in resource-constrained environments.

- **Research Keywords:** Multimodal Learning, Natural Language Processing, Machine Learning, Large Language Models, Vision-language Models, Few-shot Learning, Prompt Learning, Transfer Learning.

EDUCATION

University of Southern California, Los Angeles, California — Aug. 2018 – Present

- Ph.D. in Computer Science
- **Advisor:** Xiang Ren

Seoul National University, Seoul, Korea — Feb. 2017

- B.S. in Electrical and Computer Engineering

RESEARCH & WORK EXPERIENCE

Research Assistant at **University of Southern California**, Los Angeles, California — Aug. 2018 – Present

- **Advisor:** Xiang Ren
- Few-shot Learning for Multimodal Understanding [C10, P1]
- Enhancing Language Models by Incorporating Visual Knowledge [C9, P2]
- Temporal and Forecasting Abilities of Language Models [C7, C12]
- Improving Knowledge Graph Reasoning
  - recommendation systems [C3], knowledge graph reasoning [C4], and temporal knowledge graph reasoning [C5, C6, W1, C12].

Research Intern at **Microsoft Research (MSR)**, Redmond, Washington — Jan. 2022 – Apr. 2022

- **Mentors:** Subho Mukherjee, Yu Cheng, Yelong Shen, and Ahmed H. Awadallah
- **Project:** Grounded Vision-language Pre-training via Aligning Text and Image Regions
  - Developed techniques for generalization to unseen tasks of few-shot VL learners.
  - **Publication:** One preprint [P1] at arXiv.

Research Intern at **Microsoft Azure AI**, Redmond, Washington — June 2021 – Jan. 2022

- **Mentors:** Yu Cheng, Yelong Shen, and Weizhu Chen
- **Project:** Low-resource Prompt-based Learning for Vision-Language Models
  - Proposed zero-/few-shot vision-language learning of smaller models using simple prompts.
  - **Publication:** One paper [C10] published at *ACL 2022*.

Research Intern at **Meta AI**, Menlo Park, California — May. 2020 – Aug. 2020

- **Mentors:** Hamed Firooz and Maziar Sanjabi
- **Project:** Knowledge Distillation for Multimodal Understanding
  - Investigated the importance and effects of each modality in knowledge distillation through saliency-aware techniques for multimodal understanding.
  - **Publication:** One paper [C8] published at *EMNLP 2021 Findings* and One workshop paper [W2] published at *MAI@NAACL 2021*.

Research Assistant at **Seoul National University**, Seoul, Korea — Jan. 2016 – Apr. 2018

- **Advisor:** U Kang
- **Project:** Improving Random Walk with Restart (personalized PageRank)
  - Worked on random walk with restart techniques applied to signed networks [C1, J1], dynamic networks [C2], and edge-labeled graphs [J3]. Proposed supervised random walk with restart [J2].
  - **Publication:** One paper [C1] at *ICDM 2016*, one paper [C2] at *TheWebConf 2018*, and three journal papers [J1, J2, J3].

PUBLICATIONS

PREPRINTS

[P2] Woojeong Jin, Tejas Srinivasan, Jesse Thomason, and Xiang Ren. WinoViz: Probing Visual Properties of Objects Under Different States. *arXiv preprint*.

[P1] Woojeong Jin, Subhabrata Mukherjee, Yu Cheng, Yelong Shen, Weizhu Chen, Ahmed Hassan Awadallah, Damien Jose, and Xiang Ren. GRILL: Grounded Vision-language Pre-training via Aligning Text and Image Regions. *arXiv preprint*.

REFEREED CONFERENCE PAPERS

[C12] Dong-Ho Lee, Kian Ahrabian, Woojeong Jin, Fred Morstatter, and Jay Pujara. Temporal Knowledge Graph Forecasting Without Knowledge Using In-Context Learning. *EMNLP 2023*.

[C11] Jihyung Moon*, Dong-Ho Lee*, Hyundong J. Cho, Woojeong Jin, Chan Young Park, Minwoo Kim, Jay Pujara and Sungjoon Park. Analyzing Norm Violations in Real-Time Live-Streaming Chat. *EMNLP 2023*.

[C10] Woojeong Jin, Yu Cheng, Yelong Shen, Weizhu Chen, and Xiang Ren. A Good Prompt Is Worth Millions of Parameters: Low-resource Prompt-based Learning for Vision-Language Models. *ACL 2022 (long)*.

[C9] Woojeong Jin*, Dong-Ho Lee*, Chenguang Zhu, Jay Pujara, and Xiang Ren. Leveraging Visual Knowledge in Language Tasks: An Empirical Study on Intermediate Pre-training for Cross-Modal Knowledge Transfer. *ACL 2022 (long)*.

[C8] Woojeong Jin, Maziar Sanjabi, Shaoliang Nie, Liang Tan, Xiang Ren, and Hamed Firooz. MSD: Saliency-aware Knowledge Distillation for Multimodal Understanding. *EMNLP 2021 Findings (long)*.

[C7] Woojeong Jin, Rahul Khanna, Suji Kim, Dong-Ho Lee, Fred Morstatter, Aram Galstyan, and Xiang Ren. ForecastQA: A Question Answering Challenge for Event Forecasting with Temporal Text Data. *ACL 2021 (long)*.

[C6] Woojeong Jin, Meng Qu, Xisen Jin, and Xiang Ren. Recurrent Event Network: Autoregressive Structure Inference over Temporal Knowledge Graphs. *EMNLP 2020 (long)*.

[C5] Sankalp Garg*, Navodita Sharma*, Woojeong Jin, and Xiang Ren. Temporal Attribute Prediction via Joint Modeling of Multi-Relational Structure Evolution. *IJCAI 2020*.

[C4] Cong Fu, Tong Chen, Meng Qu, Woojeong Jin, and Xiang Ren. Collaborative Policy Learning for Open Knowledge Graph Reasoning. *EMNLP 2019 (long)*.

[C3] Weizhi Ma, Min Zhang, Yue Cao, Woojeong Jin, Chenyang Wang, Yiqun Liu, Shaoping Ma, and Xiang Ren. Jointly Learning Explainable Rules for Recommendation with Knowledge Graph. *TheWebConf 2019*.

[C2] Minji Yoon, Woojeong Jin, and U Kang. Fast and Accurate Random Walk with Restart on Dynamic Graphs with Guarantees. *TheWebConf 2018*.

[C1] Jinhong Jung, Woojeong Jin, Lee Sael, and U Kang. Personalized Ranking in Signed Networks using Signed Random Walk with Restart. *ICDM 2016*.

REFEREED JOURNAL PAPERS

[J4] Daniel M Benjamin, Fred Morstatter, Ali E Abbas, Andres Abeliuk, Pavel Atanasov, Stephen Bennett, Andreas Beger, Saurabh Birari, David V Budescu, Michele Catasta, Emilio Ferrara, Lucas Haravitch, Mark Himmelstein, KSM Tozammel Hossain, Yuzhong Huang, Woojeong Jin, Regina Joseph, Jure Leskovec, Akira Matsui, Mehrnoosh Mirtaheri, Xiang Ren, Gleb Satyukov, Rajiv Sethi, Amandeep Singh, Rok Sosic, Mark Steyvers, Pedro A Szekely, Michael D Ward, Aram Galstyan. Hybrid forecasting of geopolitical events. *AI Magazine*, 2023.

[J3] Jinhong Jung, Woojeong Jin, Ha-myung Park, and U Kang. Accurate Relational Reasoning in Edge-labeled Graphs by Multi-labeled Random Walk with Restart. *World Wide Web Journal*, 2020.

[J2] Woojeong Jin, Jinhong Jung, and U Kang. Supervised and Extended Restart in Random Walks for Ranking and Link Prediction in Networks. *PLOS ONE*, 2019.

[J1] Jinhong Jung, Woojeong Jin, and U Kang. Random Walk Based Ranking in Signed Social Networks: Model and Algorithms. *KAIS*, 2019.

WORKSHOPS

[W4] Jihyung Moon*, Dong-Ho Lee*, Hyundong J. Cho, Woojeong Jin, Chan Young Park, Minwoo Kim, Jay Pujara and Sungjoon Park. Analyzing Norm Violations in Real-Time Live-Streaming Chat. *NLP+CSS@EMNLP 2022*.

[W3] Woojeong Jin, Yu Cheng, Yelong Shen, Weizhu Chen, and Xiang Ren. A Good Prompt Is Worth Millions of Parameters: Low-resource Prompt-based Learning for Vision-Language Models. *MML@ACL 2022*.

[W2] Woojeong Jin, Maziar Sanjabi, Shaoliang Nie, Liang Tan, Xiang Ren, and Hamed Firooz. Modality-specific Distillation. *MAI@NAACL 2021*.

[W1] Woojeong Jin, Changlin Zhang, and Xiang Ren. Recurrent Event Network for Reasoning over Temporal Knowledge Graphs. *ICLR-RLGM 2019*.

PATENTS

KOREA

- **Method and Apparatus for Providing Supervised and Extended Restart in Random Walks for Ranking and Link Prediction in Networks** with Jinhong Jung and U Kang. Application number: 10-2017-0131543 (filed on Nov. 10, 2017). Registration number: 10-2048442 (registered on Nov. 19, 2019).
- **Method for Personalized Ranking in Signed Networks, Recording Medium And Device for Performing the Method.** with Jinhong Jung and U Kang. Application number: 10-2017-0005485 (filed on Jan. 12, 2017). Registration number: 10-1866866 (registered on June 05, 2018).

AWARDS & HONORS

- Kwanjeong Educational Foundation Scholarship — Aug. 2018 – 2023
- USC Annenberg Graduate Fellowship — Aug. 2018 – 2023
- Merit-based Scholarship, SNU — 2014, 2015, 2016
- National Scholarship for Science and Engineering, Korea Student Aid Foundation — 2010

[*CV compiled on 2024-02-20*]