

Bin Wang, PhD

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EDUCATION

Ph.D., Electrical Engineering, Minor in C.S.

University of Southern California (USC)

Advisor: Prof. C.-C. Jay Kuo

Aug. 2017 - May. 2021

Los Angeles, USA

M.S., Electrical Engineering

Multimodal Signal Processing, University of Southern California (USC)

Aug. 2017 - May. 2019

Los Angeles, USA

B.Eng., Electronic Information Engineering

University of Electronic Science and Technology of China (UESTC)

Full GPA with Rank: 2/351

Sep. 2013 - June 2017

Chengdu, China

Exchange Program, Electrical and Electronics Engineering

City University of Hong Kong (CityU), Main GPA: 4.3/4.3

Sep. 2015 - Jan. 2016

Hong Kong

WORK EXPERIENCE

Scientist, Tech Lead for National Multimodal LLM Program

ALI, Institute for Infocomm Research (I²R), A*STAR

Topic: Multimodal LLMs, Spoken Language Understanding

Apr. 2023 - Now

Singapore

Postdoctoral Research Fellow

Advisor: Prof. Haizhou Li, Human Language Technology Laboratory, NUS

Topic: Conversational AI, Large Language Model (LLMs)

Sep. 2021 - Mar. 2023

Singapore

Research Intern

Advisor: Dr. Jing Huang, JD AI Research

Topic: Commonsense Reasoning with Knowledge Graphs

May 2020 - Aug. 2020

Mountain View, USA

Research Assistant

Advisor: Prof. C.-C. Jay Kuo, USC

Topic: Representation Learning for Words, Sentences, and Graphs

Aug. 2017 - May 2021

Los Angeles, USA

Research Intern

Advisor: Prof. Haoxiang Lang, Ontario Tech University

July 2016 - Oct. 2016

Toronto, Canada

TEACHING

Teaching Assistant, Applied and Cloud Computing for Electrical Engineers

USC, w/ Dr. Brandon Franzke

Scope: Discussion lectures, tutorials, office hours

Spring 2021

Teaching Assistant, Applied Linear Algebra for Engineering

USC, w/ Prof. Antonio Ortega

Scope: Lab sessions, lab content design, office hours

Fall 2020, 2019

Teaching Assistant, Computer Programming for Electrical Engineers

USC, w/ Prof. Sandeep Gupta

Scope: Lead discussion lectures, office hours

Spring 2020

Teaching Assistant, Introduction to Digital Signal Processing

USC, w/ Prof. Richard Leahy, Dr. Robert Popoli

Scope: Lead discussion lectures, exam design, office hours

Spring 2019, Fall 2018

RECENT ACADEMIC AWARDS

- Best Paper Award, Workshop on Cross-Cultural Considerations in NLP (C3NLP), co-located with ACL, 2024
- Sadaoki Furui Prize Paper Award, APSIPA, 2024
- Sadaoki Furui Prize Paper Award, APSIPA, 2022
- GSG Research Travel Grant, USC, 2019

RESEARCH

I devote my effort to multimodal signal processing on natural language processing and speech technologies. I am particularly interested in language understanding and generation capabilities with multimodal AI models through learning representations.

Publications

H-Index 16, i10-index 18 with 40+ publications (for more updated sources see: Google Scholar, ORCID)

1. **Bin Wang**, Chengwei Wei, Zhengyuan Liu, Geyu Lin, Nancy F. Chen. Resilience of Large Language Models for Noisy Instructions, EMNLP Findings, 2024
2. Ayrton San Joaquin, **Bin Wang**, Zhengyuan Liu, Nicholas Asher, Brian Lim, Philippe Muller, Nancy F. Chen. In2Core: Leveraging Influence Functions for Coreset Selection in Instruction Finetuning of Large Language Models, EMNLP Findings, 2024
3. Holy Lovenia, Rahmad Mahendra, ..., **Bin Wang**, ..., Ayu Purwarianti, Sebastian Ruder, William Tjhi. SEACrowd: A Multilingual Multimodal Data Hub and Benchmark Suite for Southeast Asian Languages, EMNLP, 2024
4. Yan Xiao, Yaochu Jin, **Bin Wang**, Yan Zhang, Kuangrong Hao, Haizhou Li. Zero-Shot Relation Classification Through Inference on Category Attributes, IEEE TNNLS, 2024
5. **Bin Wang**, Xunlong Zou, Geyu Lin, Shuo Sun, Zhuohan Liu, Wenyu Zhang, Zhengyuan Liu, Ai Ti Aw, Nancy F. Chen. AudioBench: A Universal Benchmark for Audio Large Language Models, arXiv, 2024
6. **Bin Wang**, Xunlong Zou, Geyu Lin, Shuo Sun, Zhuohan Liu, Wenyu Zhang, Zhengyuan Liu, Ai Ti Aw, Nancy F. Chen. AudioBench: A Universal Benchmark for Audio Large Language Models, arXiv, 2024
7. Wenyu Zhang, Shuo Sun, **Bin Wang**, Xunlong Zou, Zhuohan Liu, Yingxu He, Geyu Lin, Nancy F. Chen, Ai Ti Aw. MoWE-Audio: Multitask AudioLLMs with Mixture of Weak Encoders, arXiv, 2024
8. **Bin Wang**, Geyu Lin, Zhengyuan Liu, Chengwei Wei, Nancy F. Chen. CRAFT: Extracting and Tuning Cultural Instructions from the Wild, C3NLP, ACL, 2024. (Best Paper Award)
9. **Bin Wang**, Geyu Lin, Zhengyuan Liu, Nancy F. Chen. CrossIn: An Efficient Instruction Tuning Approach for Cross-Lingual Knowledge Alignment, arXiv, 2024.
10. **Bin Wang**^{*}, Zhengyuan Liu^{*}, Xin Huang, Fangkai Jiao, Yang Ding, Ai Ti Aw, Nancy F. Chen. SeaEval for Multilingual Foundation Models: From Cross-Lingual Alignment to Cultural Reasoning, NAACL, 2024.
11. Yun-Cheng Wang, Xiou Ge, **Bin Wang**, C.-C. Jay Kuo. AsyncET: Asynchronous Learning for Knowledge Graph Entity Typing with Auxiliary Relations, ACM KDD, 2024.
12. Xiou Ge, Yun-Cheng Wang, **Bin Wang**, C-C Jay Kuo. Knowledge Graph Embedding with 3D Compound Geometric Transformations, APSIPA TSIP, 2024.
13. Xiou Ge, Yun-Cheng Wang, **Bin Wang**, C.-C. Jay Kuo. Knowledge Graph Embedding: An Overview, APSIPA TSIP, 2024.
14. Ridong Jiang, Wei Shi, **Bin Wang**, Chen Zhang, Yan Zhang, Chunlei Pan, Jung Jae Kim, Haizhou Li. Speech-Aware Multi-Domain Dialogue State Generation with ASR Error Correction Modules, DSTC11, SIG-Dial, 2023.
15. **Bin Wang**, Zhengyuan Liu, Nancy F. Chen. Instructive Dialogue Summarization with Query Aggregations, EMNLP, 2023.
16. **Bin Wang**, Haizhou Li. Relational Sentence Embedding for Flexible Semantic Matching, RepL4NLP - ACL, 2023.
17. Yun-Cheng Wang, Xiou Ge, **Bin Wang**, C.-C. Jay Kuo. GreenKGC: A Lightweight Knowledge Graph Completion Method, ACL, 2023.

18. Xiou Ge, Yun-Cheng Wang, **Bin Wang**, C.-C. Jay Kuo. CompoundE: Knowledge Graph Embedding with Translation, Rotation and Scaling Compound Operations, ACL, 2023.
19. Chengwei Wei, Yun-Cheng Wang, **Bin Wang**, C.-C. Jay Kuo. An Overview on Language Models: Recent Developments and Outlook, APSIPA TSIP, 2023.
20. Xiou Ge, Yun-Cheng Wang, **Bin Wang**, C.-C. Jay Kuo. TypeEA: Type-Associated Embedding for Knowledge Graph Entity Alignment, APSIPA TSIP, 2023.
21. Chengwei Wei, **Bin Wang**, C.-C. Jay Kuo. SynWMD: Syntax-aware Word Mover's Distance for Sentence Similarity Evaluation, Pattern Recognition Letters, 2023.
22. **Bin Wang**, Chen Zhang, Yan Zhang, Yiming Chen, Haizhou Li. Analyzing and Evaluating Faithfulness in Dialogue Summarization, EMNLP, 2022.
23. Yiming Chen, Yan Zhang, **Bin Wang**, Zuozhu Liu, Haizhou Li. Generate, Discriminate and Contrast: A Semi-Supervised Sentence Representation Learning Framework, EMNLP, 2022.
24. **Bin Wang**, C.-C. Jay Kuo, Haizhou Li. Just Rank: Rethinking Evaluation with Word and Sentence Similarities, ACL, 2022.
25. Yun-Cheng Wang, Xiou Ge, **Bin Wang**, C.-C. Jay Kuo. KGBoost: A Classification-Based Knowledge Base Completion Method with Negative Sampling, Pattern Recognition Letters, 2022.
26. Xiou Ge, Yun-Cheng Wang, **Bin Wang**, C.-C. Jay Kuo. CORE: A Knowledge Graph Entity Type Prediction Method via Complex Space Regression and Embedding, Pattern Recognition Letters, 2022.
27. Chengwei Wei, **Bin Wang**, C.-C. Jay Kuo. Task-Specific Dependency-based Word Embedding Methods, Pattern Recognition Letters, 2022.
28. Xie Tian, **Bin Wang**, C.-C. Jay Kuo. GraphHop: An Enhanced Label Propagation Method for Node Classification, IEEE TNNLS, 2022.
29. Kaitai Zhang, **Bin Wang**, C.-C. Jay Kuo. PEDENet: Image Anomaly Localization via Patch Embedding and Density Estimation. Pattern Recognition Letters, 2022.
30. Danqing Luo, Chen Zhang, Jiahui Xu, **Bin Wang**, Yiming Chen, Yan Zhang, Haizhou Li. Enhancing Black-Box Few-Shot Text Classification with Prompt-Based Data Augmentation, arXiv 2209.11910, 2022.
31. Kaitai Zhang*, **Bin Wang***, Wei Wang, Fahad Sohrab, Moncef Gabbouj, C.-C. Jay Kuo. AnomalyHop: An SSL-based Image Anomaly Localization Method, IEEE VCIP, 2021.
32. Kaitai Zhang, **Bin Wang**, Hong-Shuo Chen, Xuejing Lei, Ye Wang, C.-C. Jay Kuo. Dynamic Texture Synthesis by Incorporating Long-range Spatial and Temporal Correlations, International Symposium on Signals, Circuits and Systems (ISSCS), 2021.
33. **Bin Wang**, Guangtao Wang, Jing Huang, Jiaxuan You, Jure Leskovec, C.-C. Jay Kuo. Inductive Learning on Commonsense Knowledge Graph Completion, IEEE IJCNN, 2021.
34. **Bin Wang**, C.-C. Jay Kuo. SBERT-WK: A Sentence Embedding Method by Dissecting BERT-based Word Models, IEEE/ACM TASLP, 2020.
35. **Bin Wang**, Fenxiao Chen, Yun-Cheng Wang, C.-C. Jay Kuo. Efficient Sentence Embedding via Semantic Subspace Analysis, IEEE ICPR, 2020.
36. Fenxiao Chen, Yun-Cheng Wang, **Bin Wang**, C.-C. Jay Kuo. Graph Representation Learning: A Survey, APSIPA TSIP, 2020.
37. **Bin Wang***, Angela Wang*, Fenxiao Chen, Yun-Cheng Wang, C.-C. Jay Kuo. Evaluating Word Embedding Models: Methods and Experimental Results, APSIPA TSIP, 2019.
38. **Bin Wang**, Fenxiao Chen, Angela Wang, C.-C. Jay Kuo. Post-Processing of Word Representations via Variance Normalization and Dynamic Embedding, IEEE ICME, 2019.
39. Yeji Shen, Yuhang Song, Hanhan Li, Shahab Kamali, **Bin Wang**, C.-C. Jay Kuo. K-Covers for Active Learning in Image Classification, IEEE ICME Workshop, 2019.
40. Fenxiao Chen, **Bin Wang**, C.-C. Jay Kuo. Deepwalk-Assisted Graph PCA (DGPCA) for Language Networks, IEEE ICASSP, 2019.
41. **Bin Wang**, Yunze Li, Haoxiang Lang, Ying Wang. Hand Gesture Recognition and Motion Estimation using the Kinect Sensor, Mechatronic Systems and Control, 2019.
42. Fenxiao Chen, **Bin Wang**, C.-C. Jay Kuo. Graph-Based Deep-Tree Recursive Neural Network (DTRNN) for Text Classification, IEEE SLT, 2018.

ACADEMIC SERVICES

- Lead Guest Editor, APSIPA TSIP Special Issue on Pre-trained Large Language Models for Information Processing, 2024
- Publication Chair, EMNLP 2023, Singapore
- Local Organizing Team, EMNLP 2023, Singapore
- Editor Board Member, APSIPA TSIP, 2022-2025
- Session Chair, Data Mining and Knowledge Discovery I, IJCNN, 2021
- Reviewer, ACL Rolling Review, ACL, NAACL, EMNLP, ICASSP, IEEE/ACL TASLP, ICME, etc.

TALKS

- **From Semantic Understanding to Conversational AI**, The Chinese University of Hong Kong (CUHK-SZ), Shenzhen, China, Nov 2022
- **Word Representation Learning and its Evaluation**, APSIPA ASC, Chiang Mai, Thailand, August, 2022
- **Just Rank: Rethinking Evaluation with Word and Sentence Similarities**, ACL 2023, Dublin, Ireland

SELECTED PROJECTS

National Multimodal LLM

Tech Lead, NRF Grant

Dec 2023 - Onwards

Singapore

In National Multimodal LLM, we aim to build flagship AI foundation models with multimodal capabilities that could better support multilingual, multicultural environments in Singapore and Southeast Asia. We keep building SOTA models, working on data pipelines, and evaluations. More Content.

Inductive Knowledge Graph Learning

JD.com AI Research Center

May 2020 - Aug. 2020

California, USA

I investigated the challenge of inductive learning for commonsense knowledge graph completion. This research directly benefits commonsense learning, particularly in the context of knowledge-based question-answering and chatbots. BERT encoder and graph convolutional networks are studied and the proposed method achieves over 40% improvement over present methods on inductive scenarios (Where inference can be applied for unseen samples).

OTHER AWARDS

- Excellent Graduate (<1%), Sichuan, China, 2017
- National Scholarship (<2%), Sichuan, China, 2016
- Tanglixin Scholarship, Sichuan, China, 2016
- National Scholarship (<2%), Sichuan, China, 2015
- Samsung Scholarship, China, 2015
- Student Leadership Award, China, 2014

TECHNICAL SKILLS

- **Proficient:** *Python, PyTorch, L^AT_EX*
- **Intermediate:** *C++, TensorFlow, HTML*
- **Our Open-source Projects:** <https://github.com/BinWang28>

LANGUAGES

Proficient in Chinese and English.

REFERENCES

C.-C. Jay Kuo, IEEE Fellow, ACM Fellow
William M. Hogue and Distinguished Professor
ECE, CS, University of Southern California (USC)
3740 McClintock Avenue
Los Angeles, CA 90089
Phone: +1(626)375-6116
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Haizhou Li, IEEE Fellow
Presidential Chair Professor
The Chinese University of Hong Kong, Shenzhen (CUHK-SZ)
2001 Longxiang Road, Longgang District
Shenzhen, China, 518172
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Nancy F. Chen, A*STAR Fellow
Senior Principal Scientist
Aural & Language Intelligence
Institute for Infocomm Research (I²R)
Agency for Science, Technology and Research (A*STAR)
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Antonio Ortega, IEEE Fellow
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