

Bin Wang, PhD

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PARTICULARS

Education

Ph.D., Eletrical Engineering, Minor in C.S.
University of Southern California
Supervisor: Prof. C.-C. Jay Kuo

Aug. 2017 - May. 2021
Los Angeles, USA

B.Eng., Electronic Information Engineering
University of Electronic Science and Technology of China
Supervisor: Prof. Jin Qi; Rank: 2/351

Sep. 2013 - June 2017
Chengdu, China

Exchange, Electrical and Electronics Engineering
City University of Hong Kong
GPA: 4.3/4.3

Sep. 2015 - Jan. 2016
Hong Kong

Work Experience

Research Fellow with Prof. Haizhou Li
National University of Singapore
Focus: Conversational AI, Language Semantics

Sep. 2021 - Now
Singapore

Research Assistant with Prof. C.-C. Jay Kuo
University of Southern California
Focus: Representation Learning on Words, Sentences and Graphs

Aug. 2017 - May 2021
Los Angeles, USA

Research Intern with Dr. Jing Huang
JD AI Research
Focus: Commonsense Knowledge Graph Reasoning

May 2020 - Aug. 2020
Mountain View, USA

Research Intern with Prof. Haoxiang Lang
Ontario Tech University
Focus: 3D-based Hand Gesture Recognition

July 2016 - Oct. 2016
Toronto, Canada

Teaching Experience

Teaching Assistant, Applied and Cloud Computing for Electrical Engineers
University of Southern California, w/ Dr. Brandon Franzke
Discussions, Tutorials, Office hours.

Spring 2021

Teaching Assistant, Applied Linear Algebra for Engineering
University of Southern California, w/ Prof. Antonio Ortega
Lab sessions. Lab design. Office hours.

Fall 2020, 2019

Teaching Assistant, Computer Programming for Electrical Engineers
University of Southern California, w/ Prof. Sandeep Gupta
Discussions. Office hours.

Spring 2020

Teaching Assistant, Introduction to Digital Signal Processing
University of Southern California, w/ Prof. Richard Leahy, Dr. Robert Popoli
Discussions. Exams design. Office hours.

Spring 2019, Fall 2018

PUBLICATIONS

Research Interests

My research interests span the areas of natural language processing and machine learning. I have a specific interest in representation learning of words, sentences, and knowledge graphs and their applications to conversational AI.

Peer-reviewed Papers

1. **Bin Wang**, Chen Zhang, Yan Zhang, Yiming Chen, Haizhou Li. “Analyzing and Evaluating Faithfulness in Dialogue Summarization”, *Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2022. **Top Conf.**
2. Yiming Chen, Yan Zhang, **Bin Wang**, Zuozhu Liu, Haizhou Li. “Generate, Discriminate and Contrast: A Semi-Supervised Sentence Representation Learning Framework”, *Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2022. **Top Conf.**
3. **Bin Wang**, C.-C. Jay Kuo, Haizhou Li. “Just Rank: Rethinking Evaluation with Word and Sentence Similarities”, *Annual Meeting of the Association for Computational Linguistics (ACL) Oral*, 2022. **Top Conf.**
4. 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.
5. 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.
6. Chengwei Wei, **Bin Wang**, C.-C. Jay Kuo. “Task-Specific Dependency-based Word Embedding Methods”, *Pattern Recognition Letters*, 2022.
7. Xie Tian, **Bin Wang**, C.-C. Jay Kuo. “GraphHop: An Enhanced Label Propagation Method for Node Classification”, *IEEE Transactions on Neural Networks and Learning Systems (TNNLS)*, 2022. **Top Jour.**
8. Kaitai Zhang, **Bin Wang**, C.-C. Jay Kuo. “PEDENet: Image Anomaly Localization via Patch Embedding and Density Estimation”, *Pattern Recognition Letters*, 2022.
9. Kaitai Zhang*, **Bin Wang***, Wei Wang, Fahad Sohrab, Moncef Gabbouj, C.-C. Jay Kuo. “AnomalyHop: An SSL-based Image Anomaly Localization Method”, *IEEE Visual Communications and Image Processing (VCIP)*, 2021.
10. 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)*, 054, 2021.
11. **Bin Wang**, Guangtao Wang, Jing Huang, Jiaxuan You, Jure Leskovec, C.-C. Jay Kuo, “Inductive Learning on Commonsense Knowledge Graph Completion”, *International Joint Conference on Neural Networks (IJCNN)*, 2021.
12. **Bin Wang**, C.-C. Jay Kuo, “SBERT-WK: A Sentence Embedding Method by Dissecting BERT-based Word Models”, *IEEE/ACM Transactions on Audio, Speech, and Language Processing (TASLP)*, 2020. **Top Jour.**
13. **Bin Wang**, Fenxiao Chen, Yun-Cheng Wang, C.-C. Jay Kuo, “Efficient Sentence Embedding via Semantic Subspace Analysis”, *International Conference on Pattern Recognition (ICPR)*, 2020.
14. Fenxiao Chen, Yun-Cheng Wang, **Bin Wang**, C.-C. Jay Kuo, “Graph Representation Learning: A Survey”, *APSIPA Transactions on Signal and Information Processing (ATSIP)*, 2020.
15. **Bin Wang***, Angela Wang*, Fenxiao Chen, Yun-Cheng Wang, C.-C. Jay Kuo, “Evaluating Word Embedding Models: Methods and Experimental Results”, *APSIPA Transactions on Signal and Information Processing (ATSIP)*, 2019. **Sadaoki Furui Prize Paper Award, 2022**
16. **Bin Wang**, Fenxiao Chen, Angela Wang, C.-C. Jay Kuo, “Post-Processing of Word Representations via Variance Normalization and Dynamic Embedding”, *International Conference on Multimedia and Expo (ICME)*, Oral, 2019.
17. Yeji Shen, Yuhang Song, Hanhan Li, Shahab Kamali, **Bin Wang**, C.-C. Jay Kuo, “K-Covers for Active Learning in Image Classification”, *International Conference on Multimedia and Expo (ICME) Workshop*, 2019.
18. Fenxiao Chen, **Bin Wang**, C.-C. Jay Kuo, “Deepwalk-Assisted Graph PCA (DGPCA) for Language Networks”, *International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2019.

19. **Bin Wang**, Yunze Li, Haoxiang Lang, Ying Wang, “Hand Gesture Recognition and Motion Estimation using the Kinect Sensor”, *Mechatronic Systems and Control*, 2019.
20. Fenxiao Chen, **Bin Wang**, C.-C. Jay Kuo, “Graph-Based Deep-Tree Recursive Neural Network (DTRNN) for Text Classification”, *Spoken Language Technology Workshop (SLT)*, 2018

Under Review

21. **Bin Wang**, Chen Zhang, Chengwei Wei, and Haizhou Li. “A Focused Study on Sequence Length for Dialogue Summarization” *arXiv 2209.11910*, 2022. (ICASSP 2023 Sub.)
22. Yun-Cheng Wang, Xiou Ge, **Bin Wang**, and C.-C. Jay Kuo. “GreenKGC: A Lightweight Knowledge Graph Completion Method”, *arXiv 2208.09137*, 2022. (ACL 2023 Sub.)
23. Xiou Ge, Yun-Cheng Wang, **Bin Wang**, C.-C. Jay Kuo. “CompoundE: Knowledge Graph Embedding with Translation, Rotation and Scaling Compound Operations”, *arXiv 2206.10029*, 2022. (AAAI 2023 Sub.)
24. Chengwei Wei, **Bin Wang**, C.-C. Jay Kuo. “SynWMD: Syntax-aware Word Mover’s Distance for Sentence Similarity Evaluation”, *arXiv 2206.10029*, 2022. (PRL Sub.)

RESEARCH EXPERIENCE

- **Research Intern, JD AI Research**, May 2020 - Aug. 2020.
Supervisor: Guangtao Wang & Jing Huang
 At JD AI Research, I am responsible for researching the inductive learning problem on commonsense knowledge graph completion, which has applications including knowledge-based question answering and chatbot agents. Specifically, I leverage text descriptions of entities using the BERT encoder and learn structural information with graph convolutional networks. Commonsense knowledge graph completion improvements are demonstrated in both transductive and inductive settings.
- **Research Assistant, University of Southern California**, July 2017 - Aug 2018.
Supervisor: Prof. C.-C. Jay Kuo
 Our work aims to deploy modern machine learning to assist humans in aircraft maintenance. We extract video features automatically and identify potential dangers for the aircraft engine video streams. I am responsible for designing and implementing techniques, including video captioning and summarization. I built a deep learning model to learn inter-model (visual, language) translation and an unsupervised image processing pipeline to identify eventful frames. Besides, I developed a video streaming module using WebRTC on Moverio BT-300 smart glasses to adjust video streaming qualities based on various network conditions.
- **Research Assistant, Univ. of Electronic Science and Technology of China**, Oct. 2016 - June 2017.
Supervisor: Prof. Jin Qi
 This project focus on AI-assisted medical image processing. I worked on problems related to nuclei detection on breast cancer histopathology images. Due to data shortage for annotated breast cancer histopathology images, we first convert more data from publicly available datasets and perform data augmentation with image processing methods. For detection, a lightweight real-time detection framework with a convolutional neural network is proposed and optimized for our collected data.
- **Research Intern, Ontario Tech University**, July 2016 - Oct. 2016.
Supervisor: Prof. Haoxiang Lang
 In this project, we focus on visual-enhanced robotics. I developed a visual understanding module for human gesture language from RGB-D images captured with Kinect sensors. It is further integrated with Turtlebot hardware. Based on our hand gesture recognition and motion estimation results, the robotic can perform pre-defined tasks with the integration of SLAM.

ACADEMIC SERVICES

- Editor Board (2022-2025) - APSIPA Transactions on Signal and Information Processing
- Session Chair - *IJCNN 2021 - Data Mining And Knowledge Discovery I*
- Reviewer - *ACL Rolling Review, ACL, NAACL, EMNLP, IEEE/ACM TASLP, ICME, AAAI, etc.*

TECHNICAL SKILLS

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

LANGUAGES

Proficient in Chinese and English.

REFERENCES

C.-C. Jay Kuo
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Los Angeles, CA 90089
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