BIN WANG

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PARTICULARS

WORK EXPERIENCE

Research Fellow, National University of Singapore — Singapore
Advisor: Prof. Haizhou Li — *Sep. 2021 - Now*
Topic: Natural Language Processing on Dialogues

Research Intern, JD AI Research — Mountain View, CA, USA
Advisor: Dr. Jing Huang — *May 2020 - Aug. 2020*
Topic: Commonsense Knowledge Graph Reasoning

Research Intern, Ontario Tech University — Toronto, Canada
Advisor: Prof. Haoxiang Lang — *July 2016 - Oct. 2016*
Topic: 3D-based Hand Gesture Recognition

EDUCATION

University of Southern California — Los Angeles, USA
PhD in Electrical Engineering — *Aug. 2017 - May. 2021*
Advisor: Prof. C.-C. Jay Kuo

University of Southern California — Los Angeles, USA
M.S. in Electrical Engineering — *Aug. 2017 - May. 2019*

University of Electronic Science and Technology of China (UESTC) — Chengdu, China
B.Eng. in Electronic Information Engineering — *Sep. 2013 - June 2017*
Advisor: Prof. Jin Qi; Rank: 2/351

City University of Hong Kong — Hong Kong
Exchange Student in Electrical and Electronics Engineering — *Sep. 2015 - Jan. 2016*
GPA: 4.3/4.3

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.

PUBLICATIONS

PEER-REVIEWED PAPERS

1. **Bin Wang**, C.-C. Jay Kuo, Haizhou Li. "Just Rank: Rethinking Evaluation with Word and Sentence Similarities", *60th Annual Meeting of the Association for Computational Linguistics (ACL)*, 2022.
2. 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.
3. 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.
4. Chengwei Wei, **Bin Wang**, C.-C. Jay Kuo. "Task-Specific Dependency-based Word Embedding Methods", *Pattern Recognition Letters*, 2022.
5. 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.

6. Kaitai Zhang, **Bin Wang**, C.-C. Jay Kuo. "PEDENet: Image Anomaly Localization via Patch Embedding and Density Estimation", *Pattern Recognition Letters*, 2022.
7. 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.
8. 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.
9. **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.
10. **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.
11. **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.
12. 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.
13. **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.
14. **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)*, 2019.
15. 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.
16. 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.
17. **Bin Wang**, Yunze Li, Haoxiang Lang, Ying Wang, "Hand Gesture Recognition and Motion Estimation using the Kinect Sensor", *Mechatronic Systems and Control*, 2019.
18. 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

PAPERS UNDER REVIEW OR PREPRINT

19. 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.
20. Chengwei Wei, **Bin Wang**, C.-C. Jay Kuo. "SynWMD: Syntax-aware Word Mover's Distance for Sentence Similarity Evaluation", *ArXiv 2206.10029*, 2022.

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.

TEACHING

- Teaching Experience
  - **Teaching Assistant,** EE 599: Applied and Cloud Computing for Electrical Engineers, Brandon Franzke, Spring 2021, University of Southern California.
  - **Teaching Assistant,** EE 141L: Applied Linear Algebra for Engineering, Prof. Antonio Ortega, Fall 2020, Fall 2019, University of Southern California.
  - **Teaching Assistant,** EE 155L: Computer Programming for Electrical Engineers, Prof. Sandeep Gupta, Spring 2020, University of Southern California.
  - **Teaching Assistant,** EE 483: Digital Signal Processing, Prof. Richard Leahy, Robert Popoli, Spring 2019, Fall 2018, University of Southern California.

SERVICE

- Reviewer (Journals) - *IEEE/ACM TASLP, Natural Language Engineering, IEEE Access.*
- Reviewer (Conferences) - *ACL Rolling Review, NAACL 2021, ICME 2019/20/21, EMNLP 2020.*
- Session Chair - *IJCNN 2021 - Data Mining And Knowledge Discovery I*

TECHNICAL EXPERIENCE

- Proficient: *Python, PyTorch, Matlab, LaTeX.*
- Intermediate: *C++, TensorFlow*
- GitHub: `https://github.com/BinWang28`.

LANGUAGES

Proficient Chinese and English.

REFERENCES

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Los Angeles, CA 90089
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