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Education

2016 – 2019	🔖 **Ph.D., Nanyang Technological University.** Computer Science. Singapore. Thesis title: *Bridging images and natural language with deep learning.* Advisors: *Prof. Jianfei Cai, Dr. Gang Wang, Prof. Tsuhan Chen.*
2010 – 2013	🔖 **M.Sc., University of Chinese Academy of Sciences**. Beijing, China. Electronic and Communications Engineering.
2006 – 2010	🔖 **B.Sc., Jiangsu University**. Jiangsu, China. Electronic Information Science and Technology.

Employment History

2020.01 – ····	🔖 **Research Scientist** Document Intelligence Lab of Adobe Research, MD, US. *Document Understanding and Reasoning; Uncertainty & Out-of-Distribution; Self-Supervised Learning; Human-in-the-loop; Privacy Preserving.*
2018.08 – 2018.11	🔖 **Research Intern.** Adobe Research, San Jose, CA, US. Scene Graph Generation.
2015.03 – 2015.12	🔖 **Research Associate.** Nanyang Technological University, ROSE Lab, Singapore. Implementing vision capabilities in embedded systems. Participated in ImageNet 2015 (**5-th** position). MS COCO Image Captioning Challenge 2017 (**6-th** position).
2013.06 – 2015.02	🔖 **SoC FPGA Verification Leader.** Chinese Academy of Sciences, Beijing, China. Leading the SoC Chip software simulation and FPGA verification group.

Research Publications

Conference Proceedings

1. Shengcao Cao, **Jiuxiang Gu**, Jason Kuen, Hao Tan, Ruiyi Zhang, Handong Zhao, Ani Nenkova, Liang-Yan Gui, Tong Sun, Yu-Xiong Wang, "SOHES: Self-supervised Open-world Hierarchical Entity Segmentation". In: *ICLR*. 2024.

2. **Jiuxiang Gu**, Xiangxi Shi, Jason Kuen, Lu Qi, Ruiyi Zhang, Anqi Liu, Ani Nenkova, Tong Sun, "ADoPD: A Large-Scale Document Page Decomposition Dataset". In: *ICLR*. 2024.

3. Puneet Mathur, Vlad I Morariu, Aparna Garimella, Franck Dernoncourt, **Jiuxiang Gu**, Ramit Sawhney, Preslav Nakov, Dinesh Manocha, Rajiv Jain, "DocScript: Document-level Script Event Prediction". In: *COLING*. 2024.

4. Lu Qi, Jason Kuen, Weidong Guo, **Jiuxiang Gu**, Zhe Lin, Bo Du, Yu Xu, Ming-Hsuan Yang, "Aims: All-inclusive multi-level segmentation for anything". In: *NeurIPS*. 2024.

5. Yufan Zhou, Ruiyi Zhang, **Jiuxiang Gu**, Tong Sun, "Customization Assistant for Text-to-image Generation". In: *CVPR*. 2024.

6. Zhendong Chu, Ruiyi Zhang, Tong Yu, Rajiv Jain, Vlad I Morariu, **Jiuxiang Gu**, Ani Nenkova, "Improving a Named Entity Recognizer Trained on Noisy Data with a Few Clean Instances". In: *NNACL*. 2023.

7. **Jiuxiang Gu**, Yifei Ming, Yi Zhou, Jason Kuen, Vlad Morariu, Handong Zhao, Ruiyi Zhang, Nikolaos Barmpalios, Anqi Liu, Yixuan Li, "A Critical Analysis of Document Out-of-Distribution Detection". In: *EMNLP*. 2023.

8. Yicong Hong, Kai Zhang, **Jiuxiang Gu**, Sai Bi, Yang Zhou, Difan Liu, Feng Liu, Kalyan Sunkavalli, Trung Bui, Hao Tan, "Lrm: Large reconstruction model for single image to 3d". In: *ICLR*. 2023.

9. Ming Li, Lichang Chen, Jiuhai Chen, Shwai He, Heng Huang, **Jiuxiang Gu**, Tianyi Zhou, "Reflection-tuning: Data recycling improves llm instruction-tuning". In: *ACL (Findings)*. 2023.

10. Qi Lu, Jason Kuen, Shen Tiancheng, **Gu Jiuxiang**, Guo Weidong, Jia Jiaya, Lin Zhe, Yang Ming-Hsuan, "High-Quality Entity Segmentation". In: *ICCV*. 2023.

11. Puneet Mathur, Rajiv Jain, **Jiuxiang Gu**, Franck Dernoncourt, Dinesh Manocha, Vlad I Morariu, "DocEdit: language-guided document editing". In: *AAAI*. 2023.

12. Puneet Mathur, Rajiv Jain, Ashutosh Mehra, **Jiuxiang Gu**, Franck Dernoncourt, Quan Tran, Verena Kaynig-Fittkau, Ani Nenkova, Dinesh Manocha, Vlad I Morariu, "LayerDoc: layer-wise extraction of spatial hierarchical structure in visually-rich documents". In: *WACV*. 2023.

13. Gaurav Verma, Ryan A Rossi, Christopher Tensmeyer, **Jiuxiang Gu**, Ani Nenkova, "Learning the visualness of text using large vision-language models". In: *EMNLP*. 2023.

14. Zilong Wang, **Jiuxiang Gu**, Chris Tensmeyer, Nikolaos Barmpalios, Ani Nenkova, Tong Sun, Jingbo Shang, Vlad I Morariu, "MGDoc: Pre-training with multi-granular hierarchy for document image understanding". In: *EMNLP*. 2023.

15. Jiahui Gao, Yi Zhou, LH Philip, Shafiq Joty, **Jiuxiang Gu,** "UNISON: Unpaired cross-lingual image captioning". In: *AAAI*. 2022.

16. Dat Huynh, Jason Kuen, Zhe Lin, **Jiuxiang Gu**, Ehsan Elhamifar, "Open-vocabulary instance segmentation via robust cross-modal pseudo-labeling". In: *CVPR*. 2022.

17. Phung Lai, NhatHai Phan, Tong Sun, Rajiv Jain, Franck Dernoncourt, **Jiuxiang Gu**, Nikolaos Barmpalios, "User-Entity Differential Privacy in Learning Natural Language Models". In: *Big Data*. 2022.

18. Haoyu Ma, Handong Zhao, Zhe Lin, Ajinkya Kale, Zhangyang Wang, Tong Yu, **Jiuxiang Gu**, Sunav Choudhary, Xiaohui Xie, "Ei-clip: Entity-aware interventional contrastive learning for e-commerce cross-modal retrieval". In: *CVPR*. 2022.

19. Puneet Mathur, Franck Dernoncourt, Quan Hung Tran, **Jiuxiang Gu**, Ani Nenkova, Vlad I Morariu, Rajiv Jain, Dinesh Manocha, "DocLayoutTTS: Dataset and Baselines for Layout-informed Document-level Neural Speech Synthesis." In: *INTERSPEECH*. 2022.

20. Puneet Mathur, Vlad Morariu, Verena Kaynig-Fittkau, **Jiuxiang Gu**, Franck Dernoncourt, Quan Hung Tran, Ani Nenkova, Dinesh Manocha, Rajiv Jain, "Doctime: A document-level temporal dependency graph parser". In: *NNACL*. 2022.

21. Lu Qi, Jason Kuen, Zhe Lin, **Jiuxiang Gu**, Fengyun Rao, Dian Li, Weidong Guo, Zhen Wen, Ming-Hsuan Yang, Jiaya Jia, "Ca-ssl: Class-agnostic semi-supervised learning for detection and segmentation". In: *ECCV*. 2022.

22. Haoxuan Qu, Yanchao Li, Lin Geng Foo, Jason Kuen, **Jiuxiang Gu**, Jun Liu, "Improving the reliability for confidence estimation". In: *ECCV*. 2022.

23. Haoyu Wang, Handong Zhao, Yaqing Wang, Tong Yu, **Jiuxiang Gu**, Jing Gao, "FedKC: Federated knowledge composition for multilingual natural language understanding". In: *ACM Web*. 2022.

24. Zihan Wang, **Jiuxiang Gu**, Jason Kuen, Handong Zhao, Vlad Morariu, Ruiyi Zhang, Ani Nenkova, Tong Sun, Jingbo Shang, "Learning adaptive axis attentions in fine-tuning: Beyond fixed sparse attention patterns". In: *ACL*. 2022.

25. Li Xu, Haoxuan Qu, Jason Kuen, **Jiuxiang Gu**, Jun Liu, "Meta spatio-temporal debiasing for video scene graph generation". In: *ECCV*. 2022.

26. Yufan Zhou, Ruiyi Zhang, Changyou Chen, Chunyuan Li, Chris Tensmeyer, Tong Yu, **Jiuxiang Gu**, Jinhui Xu, Tong Sun, "Towards language-free training for text-to-image generation". In: *CVPR*. 2022.

27. Yufan Zhou, Ruiyi Zhang, **Jiuxiang Gu**, Chris Tensmeyer, Tong Yu, Changyou Chen, Jinhui Xu, Tong Sun, "Tigan: Text-based interactive image generation and manipulation". In: *AAAI*. 2022.

28. Mengnan Du, Varun Manjunatha, Rajiv Jain, Ruchi Deshpande, Franck Dernoncourt, **Jiuxiang Gu**, Tong Sun, Xia Hu, "Towards interpreting and mitigating shortcut learning behavior of NLU models". In: *NNACL*. 2021.

29. Jiahui Gao, Yi Zhou, Philip LH Yu, **Jiuxiang Gu,** "Unsupervised cross-lingual image captioning". In: *AAAI*. 2021.

30. Peizhao Li, **Jiuxiang Gu**, Jason Kuen, Vlad I Morariu, Handong Zhao, Rajiv Jain, Varun Manjunatha, Hongfu Liu, "Selfdoc: Self-supervised document representation learning". In: *CVPR*. 2021.

31. Lu Qi, Jason Kuen, **Jiuxiang Gu**, Zhe Lin, Yi Wang, Yukang Chen, Yanwei Li, Jiaya Jia, "Multi-scale aligned distillation for low-resolution detection". In: *CVPR*. 2021.

32. Huiyuan Yang, Lijun Yin, Yi Zhou, **Jiuxiang Gu,** "Exploiting semantic embedding and visual feature for facial action unit detection". In: *CVPR*. 2021.

33. **Jiuxiang Gu**, Jason Kuen, Shafiq Joty, Jianfei Cai, Vlad Morariu, Handong Zhao, Tong Sun, "Self-supervised relationship probing". In: *NeurIPS*. Vol. 33. 2020, pp. 1841–1853.

34. Xiangxi Shi, Xu Yang, **Jiuxiang Gu**, Shafiq Joty, Jianfei Cai, "Finding it at another side: A viewpoint-adapted matching encoder for change captioning". In: *ECCV*. 2020.

35. Shuhan Yao, **Jiuxiang Gu**, Huajun Zhang, Peng Wang, Xiaochuan Liu, Tianyang Zhao, "Resilient load restoration in microgrids considering mobile energy storage fleets: A deep reinforcement learning approach". In: *PESGM*. 2020.

36. **Jiuxiang Gu**, Shafiq R Joty, Jianfei Cai, Handong Zhao, Xu Yang, Gang Wang, "Unpaired image captioning via scene graph alignments. In 2019 IEEE". In: *ICCV*. 2019.

37. **Jiuxiang Gu**, Handong Zhao, Zhe Lin, Sheng Li, Jianfei Cai, Mingyang Ling, "Scene graph generation with external knowledge and image reconstruction". In: *CVPR*. 2019.

38. Xiangxi Shi, Jianfei Cai, Shafiq Joty, **Jiuxiang Gu,** "Watch It Twice: Video Captioning with a Refocused Video Encoder". In: *ACM Multimedia*. 2019.

39. Muhammet Bastan, Xiangxi Shi, **Jiuxiang Gu**, Zhao Heng, Chen Zhuo, Dennis Sng, Alex C Kot, "NTU ROSE Lab at TRECVID 2018: Ad-hoc Video Search and Video to Text." In: *TRECVID*. 2018.

40. **Jiuxiang Gu**, Jianfei Cai, Shafiq Joty, Li Niu, Gang Wang, "Look, Imagine and Match: Improving Textual-Visual Cross-Modal Retrieval with Generative Models". In: *CVPR*. 2018.

41. **Jiuxiang Gu**, Jianfei Cai, Gang Wang, Tsuhan Chen, "Stack-Captioning: Coarse-to-Fine Learning for Image Captioning". In: *AAAI*. 2018.

42. **Jiuxiang Gu**, Shafiq Joty, Jianfei Cai, Gang Wang, "Unpaired image captioning by language pivoting". In: *ECCV*. 2018.

43. **Jiuxiang Gu**, Gang Wang, Jianfei Cai, Tsuhan Chen, "An empirical study of language cnn for image captioning". In: *ICCV*. 2017.

Journal Articles

1. **Jiuxiang Gu**, Chenyang Li, Yingyu Liang, Zhenmei Shi, Zhao Song, "Exploring the Frontiers of Softmax: Provable Optimization, Applications in Diffusion Model, and Beyond". In: *arXiv* (2024).

2. **Jiuxiang Gu**, Chenyang Li, Yingyu Liang, Zhenmei Shi, Zhao Song, Tianyi Zhou, "Fourier Circuits in Neural Networks: Unlocking the Potential of Large Language Models in Mathematical Reasoning and Modular Arithmetic". In: *arXiv* (2024).

3. **Jiuxiang Gu**, Yingyu Liang, Heshan Liu, Zhenmei Shi, Zhao Song, Junze Yin, "Conv-basis: A new paradigm for efficient attention inference and gradient computation in transformers". In: *arXiv* (2024).

4. **Jiuxiang Gu**, Yingyu Liang, Zhenmei Shi, Zhao Song, Yufa Zhou, "Tensor Attention Training: Provably Efficient Learning of Higher-order Transformers". In: *arXiv* (2024).

5. — "Unraveling the Smoothness Properties of Diffusion Models: A Gaussian Mixture Perspective". In: *arXiv* (2024).

6. Yanzhe Zhang, Ruiyi Zhang, **Jiuxiang Gu**, Yufan Zhou, Nedim Lipka, Diyi Yang, Tong Sun, "Llavar: Enhanced visual instruction tuning for text-rich image understanding". In: *arXiv preprint arXiv:2306.17107* (2023).

7. Yifei Ming, Ziyang Cai, **Jiuxiang Gu**, Yiyou Sun, Wei Li, Yixuan Li, "Delving into out-of-distribution detection with vision-language representations". In: *NeurIPS* (2022).

8. Lu Qi, Jason Kuen, Yi Wang, **Jiuxiang Gu**, Hengshuang Zhao, Philip Torr, Zhe Lin, Jiaya Jia, "Open world entity segmentation". In: *TPAMI* (2022).

9. Xiangxi Shi, Jianfei Cai, **Jiuxiang Gu**, Shafiq Joty, "Video Captioning with Boundary-aware Hierarchical Language Decoding and Joint Video Prediction". In: *Neurocomputing* (2018).

10. **GU Jiuxiang**, YANG Renzhong, SHI Lu, WEI Hongwei, "HJ-1C real-time image processing technology based on GPU". In: *Journal of University of Chinese Academy of Sciences* (2014).

11 Jiu-xiang GU, Ren-zhong YANG, Hong-wei WEI, "Research of RS Decoding Technology Based on GPU". In: *Microelectronics and Computer* (2013).

Miscellaneous Experience

Awards and Achievements

2016-2019	Research Scholarship (NTU'19), AAAI Student Travel Grant('18).
2010	Merit Graduate, Outstanding Undergraduate Thesis.
2008	The 1st prize in China Undergraduate Mathematical Contest in Modeling (Jiangsu).
	The 1st prize in Undergraduate Electronic Design Contest (Jiangsu).
2007-2010	Merit Student & 1st-class scholarship ('07). Merit Student & 2nd-class scholarship ('08/'09).

Teaching

2019 CZ3005	Nanyang Technological University, Teaching Assistant
2019 CZ1012	Nanyang Technological University, Teaching Assistant

Service

Conference Reviewer	Area Chair (WACV 2024). Senior Program Committee of IJCAI (2021,2022,2023). Program Committee of AAAI'19/'20/'21/'22'23, IJCAI'21/'22, NNACL's20. ICLR'20'21, NeruIPS'20'21'22, CVPR'18'19'20'21'22'23, ECCV'18'20, ICCV'19.
Journal Reviewer	T-PAMI, IJCV, JMLR, T-IP, T-MM, T-NNLS, T-CSVT, T-SMC-B, PR, PRL, etc.