ZHIRUI ZHANG

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Bio

I am currently an Algorithm Expert in the Language Technology Lab at Alibaba DAMO Academy. I received my Ph.D. degree from the University of Science and Technology in 2019, supervised by Prof. Enhong Chen from USTC and Prof. Harry Shum from MSRA. Prior to that, I obtained my bachelor's degree from University of Science and Technology of China in 2014. So far, I have published more than 10 papers in top AI conferences, including ACL/EMNLP/NAACL/NeurIPS/AAAI.

Research Interests

- **Natural Language Processing:** Neural Machine Translation, Dialogue System, Natural Language Generation, Dependency Parsing
- **Machine Learning:** Deep Reinforcement Learning, Transfer Learning, Generative Adversarial Network

Experience

July 2019 — Now: Algorithm Export, Language Technology Lab, Alibaba DAMO Academy
Conducting development and research for Alibaba Translation
Mentored by Boxing Chen and Weihua Luo
Feb. 2019 — June 2019: Research Intern, Natural Language Computing Group, Microsoft Research Asia
Conducting research in NLP and ML fields
Mentored by Shujie Liu
July 2018 — Jan. 2019: Research Intern, Microsoft AI & Research, Redmond
Conducting research in Dialogue System
Mentored by Xiujun Li and Jianfeng Gao
July 2015 — July 2018: Research Intern, Natural Language Computing Group, Microsoft Research Asia
Conducting research in NLP and ML fields (Joint Ph.D. program)
Mentored by Mu Li
July 2013 — June 2014: Research Intern, Natural Language Computing Group, Microsoft Research Asia
Conducting research in Distributed Word Representation (Pre-Ph.D. program)
Mentored by Mu Li

Education

Sept. 2014 - June 2019: University of Science and Technology of China
Ph.D. candidate in Computer Science & Joint Ph.D. Program with Microsoft Research Asia
School of Computer Science and Technology
Co-advisors: *Enhong Chen and Harry Shum*
Sept. 2010 - June 2014: University of Science and Technology of China
B.S. in Computer Science
School of Computer Science and Technology

Publications

- Junliang Guo, **Zhirui Zhang**, Linli Xu, Hao-Ran Wei, Boxing Chen and Enhong Chen. **Incorporating BERT into Parallel Sequence Decoding with Adapters.** *Proceeding of NeurIPS 2020.*
- Hao-Ran Wei, **Zhirui Zhang**, Boxing Chen and Weihua Luo. **Iterative Domain-Repaired Back-Translation.** *Proceeding of EMNLP2020.*
- Baijun Ji, **Zhirui Zhang,** Xiangyu Duan, Min Zhang, Boxing Chen and Weihua Luo. **Cross-lingual Pre-training Based Transfer for Zero-shot Neural Machine Translation.** *Proceeding of AAAI 2020, New York, USA.*
- **Zhirui Zhang,** Xiujun Li, Jianfeng Gao and Enhong Chen. **Budgeted Policy Learning for Task-Oriented Dialogue Systems.** *Proceeding of ACL 2019, Florence, Italy.*
- **Zhirui Zhang,** Shuangzhi Wu, Shujie Liu, Mu Li, Ming Zhou and Tong Xu, **Regularizing Neural Machine Translation by Target-bidirectional Agreement.** *Proceeding of AAAI 2019, Honolulu, Hawaii, USA.*
- Shuo Ren*, **Zhirui Zhang*,** Shujie Liu, Ming Zhou and Shuai Ma. **Unsupervised Neural Machine Translation with SMT as Posterior Regularization.** *Proceeding of AAAI 2019, Honolulu, Hawaii, USA.* (* equal contribution)
- Shuangzhi Wu, Dongdong Zhang, **Zhirui Zhang,** Nan Yang, Mu Li and Ming Zhou. **Dependency-to-Dependency Neural Machine Translation.** *IEEE/ACM Transactions on Audio, Speech and Language Processing, 2018.*
- **Zhirui Zhang,** Shujie Liu, Mu Li, Ming Zhou and Enhong Chen. **Bidirectional Generative Adversarial Networks for Neural Machine Translation.** *Proceeding of CoNLL 2018, Brussels, Belgium.*
- **Zhirui Zhang,** Shujie Liu, Mu Li, Ming Zhou and Enhong Chen. **Coarse-To-Fine Learning for Neural Machine Translation.** *Proceeding of NLPCC 2018, China.*
- **Zhirui Zhang,** Shujie Liu, Mu Li, Ming Zhou and Enhong Chen. **Joint Training for Neural Machine Translation Models with Monolingual Data.** *Proceeding of AAAI 2018, New Orleans, Louisiana, USA.*

- Wenhu Chen, Guanlin Li, Shuo Ren, Shujie Liu, **Zhirui Zhang,** Mu Li and Ming Zhou. **Generative Bridging Network in Neural Sequence Prediction.** *Proceeding of NAACL 2018, New Orleans, Louisiana, USA.*
- Duyu Tang, Nan Duan, Zhao Yan, **Zhirui Zhang,** Yibo Sun, Shujie Liu, Yuanhua Lv and Ming Zhou. **Learning to Collaborate for Question Answering and Asking.** *Proceeding of NAACL 2018, New Orleans, Louisiana, USA.*
- **Zhirui Zhang,** Shujie Liu, Mu Li, Ming Zhou and Enhong Chen. **Stack-based Multi-layer Attention for Transition-based Dependency Parsing.** *Proceeding of EMNLP 2017, Copenhagen, Denmark.*
- Hany Hassan, Anthony Aue, Chang Chen, Vishal Chowdhary, Jonathan Clark, Christian Federmann, Xuedong Huang, Marcin Junczys-Dowmunt, William Lewis, Mu Li, Shujie Liu, Tie-Yan Liu, Renqian Luo, Arul Menezes, Tao Qin, Frank Seide, Xu Tan, Fei Tian, Lijun Wu, Shuangzhi Wu, Yingce Xia, Dongdong Zhang, **Zhirui Zhang** and Ming Zhou. **Achieving Human Parity on Automatic Chinese to English News Translation,** 2018. (https://arxiv.org/abs/1803.05567)
- **Zhirui Zhang*,** Shuo Ren*, Shujie Liu, Jianyong Wang, Peng Chen, Mu Li, Ming Zhou and Enhong Chen. **Style Transfer as Unsupervised Machine Translation**, 2018. (https://arxiv.org/abs/1808.07894) (* equal contribution)
- Wenhu Chen, Guanlin Li, Shujie Liu, **Zhirui Zhang**, Mu Li, Ming Zhou. **Approximate Distribution Matching for Sequence-to-Sequence Learning**, 2018. (https://arxiv.org/abs/1808.08003)

Projects

o **SmartFlow Toolkit (2016)**
SmartFlow is a deep learning tool designed by **Zhirui Zhang** and Mu Li on C# platform. Similar with Theano and Tensorflow, it includes operation computation, computation graph scheduling, and memory management. Besides, SmartFlow achieves faster computation graph building and better memory utilization than Theano and Tensorflow, so it is friendlier for debugging and designing new models. At present, SmartFlow toolkit has been used to XiaoIce's dialog generation and some Bing products.

o **Writing Intelligence Project (2017)**
Writing Intelligence Project attempts to leverage new deep learning techniques to make writing more convenient. Different from Grammarly which focuses on checking grammar, the whole project includes sentence completion (Similar with Google's Smart Compose), sentence generation based on keywords, grammar inspection and recommendation, and next sentence prediction.

o **Babel Project (2017-2018)**
Babel Project aims to achieve human-comparable machine translation on news domain. My joint-training approach (accepted by AAAI 2018) and model regularization method

(submit to EMNLP 2018) are employed in this project, and we obtain the best result on WMT 2017 Chinese-English translation task (Our single model **27.71** vs Sogou's ensemble system 26.40).

Awards

- Google Excellent Scholarship - 2013
- National Scholarship – 2013

Programming Skills

- Programming Language: C++, C#, Python, Java
- Deep Learning Tools: Theano, Tensorflow, Pytorch
- GPU Programming