

# ZHIRUI ZHANG

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## Education

**University of Science and Technology of China**

Sept. 2014 – June 2019

Ph.D. candidate in Computer Science & Joint Ph.D.

(Expected)

Program with Microsoft Research Asia

School of Computer Science and Technology

Co-advisors: *Enhong Chen and Harry Shum*

**University of Science and Technology of China**

Sept. 2010 – June 2014

B.S. in Computer Science

School of Computer Science and Technology

## Experience

**Microsoft AI & Research, Redmond**

Aug. 2018 - Present

Research Intern

Mentored by Jianfeng Gao and Xiujun Li

Business AI Group

**Microsoft Research Asia**

July 2015 – July 2018

Research Intern

Mentored by Mu Li and Shujie Liu

Natural Language Computing Group

**Microsoft Research Asia**

July 2013 – June 2014

Research Intern

Mentored by Mu Li

Natural Language Computing Group

## Research Interests

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

## Publications

- **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.
- 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.
- Wenhua 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.

## Preprints

- 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>)
- Wenhui 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

- **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.

➤ **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.

➤ **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
- GPU Programming