

# Zhihong Shao

E-mail: [zhshaothu@gmail.com](mailto:zhshaothu@gmail.com)

Phone: +86 13121259158

Web: <https://ZhihongShao.github.io>

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## RESEARCH INTERESTS

My interests are in natural language processing and deep learning. I am particularly interested in how we can build a robust and scalable AI system that can leverage diverse skills (e.g., retrieval, logical reasoning, and numerical reasoning) to aggregate possibly-heterogeneous information and answer natural language questions precisely regardless of their complexity. My recent work focused on (i) comprehensive exploitation of large-scale textual knowledge for multi-answer question answering [2], (ii) (weakly-supervised) neuro-symbolic models for complex discrete reasoning [1][4], (iii) robust classification and text matching (e.g., paraphrase detection and natural language inference) [3].

## EDUCATION

**Tsinghua University**, Beijing, China

September 2019 - Present

*Ph.D. Student*, Computer Science and Technology

*Advisor*: Minlie Huang

**Beihang University**, Beijing, China

September 2015 – July 2019

*B.E.*, Computer Science and Technology

*GPA*: 3.86/4, *Rank*: 2/213

## PUBLICATIONS

- [1] [Chaining Simultaneous Thoughts for Numerical Reasoning](#)  
**Zhihong Shao**, Fei Huang, and Minlie Huang  
*Findings of Empirical Methods in Natural Language Processing (Findings of EMNLP)*, 2022.
- [2] [Answering Open-Domain Multi-Answer Questions via a Recall-then-Verify Framework](#)  
**Zhihong Shao**, and Minlie Huang  
*Annual Meeting of the Association for Computational Linguistics (ACL)*, 2022.  
(Best QA system on the [AmbigNQ](#) leaderboard)
- [3] [AdvExpander: Generating Natural Language Adversarial Examples by Expanding Text](#)  
**Zhihong Shao**, Zhongqin Wu, and Minlie Huang  
*IEEE/ACM Transactions on Audio, Speech, and Language Processing (TASLP)*, vol. 30, pp. 1184-1196, 2022.
- [4] [A Mutual Information Maximization Approach for the Spurious Solution Problem in Weakly Supervised Question Answering](#)  
**Zhihong Shao**, Lifeng Shang, Qun Liu, and Minlie Huang  
*Annual Meeting of the Association for Computational Linguistics (ACL)*, 2021.
- [5] [Long and Diverse Text Generation with Planning-based Hierarchical Variational Model](#)  
**Zhihong Shao**, Minlie Huang, Jiangtao Wen, Wenfei Xu, and Xiaoyan Zhu  
*Empirical Methods in Natural Language Processing (EMNLP)*, 2019.

## PREPRINT

- [6] [CoTK: An Open-Source Toolkit for Fast Development and Fair Evaluation of Text Generation](#)  
Fei Huang, Dazhen Wan, **Zhihong Shao**, Pei Ke, Jian Guan, Yilin Niu, Xiaoyan Zhu, and Minlie Huang  
*Arxiv abs/2002.00583*, 2020.

RESEARCH EXPERIENCE	<b>CoAI Lab, Tsinghua University</b>	Sep 2019-Present, Beijing, China
	<i>Ph.D. Student (Supervisor: Minlie Huang)</i> Worked on open-domain multi-answer question answering [2], neuro-symbolic reasoning [1][4], robust classification and text matching [3], and data-to-text generation [5].	
	<b>Huawei Noah's Ark Lab</b>	Jun 2020-Oct 2020, Shenzhen, China
	<i>Research Intern (Supervisor: Lifeng Shang)</i> Worked on neuro-symbolic reasoning [4] under a weakly-supervised setting, where we selected high-quality symbolic reasoning processes for training via mutual information maximization.	
AWARDS	<b>2nd Prize</b> , Comprehensive Scholarship, Tsinghua University	2021
	<b>3rd Prize</b> , the National Final of "LAN QIAO CUP" C/C++ Group	2018
	<b>China National Scholarship</b>	2017
	<b>1st Prize</b> , National College Students Mathematics Competition (non-math-major)	2016
	<b>China National Scholarship</b>	2016
SERVICES	<b>Reviewer/Program Committee:</b> ACL, EMNLP, NLPCC, ARR	
TEACHING ASSISTANT	<b>Artificial Neural Network</b>	2019 Fall, 2020 Fall, 2021 Fall
	<i>Instructor: Minlie Huang</i>  <b>Object-Oriented Programming</b>	
	<i>Instructor: Minlie Huang</i> <i>Also gave guest lectures and made assignments</i>	
		2020 Spring, 2021 Spring, 2022 Spring