Haozhe Ji (计昊哲)

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Research Interests

I have broad research interests in natural language generation, language modeling, and deep learning. I am particularly interested in techniques and theories to build *verifiable*, *consistent* and *robust* AI systems that generate human-like natural language.

My research is dedicated to improving language models (LMs) beyond the standard framework of Auto-Regressive (AR) modeling and Maximum Likelihood Estimation (MLE) objective, with the goal of producing more human-like natural language. Recently, I am focusing on the problem of aligning LMs with human preferences. In particular, my principal works aim to tackle the intrinsic limitations associated with AR modeling and the MLE objective:

- To overcome the capacity limitation of AR models, my research delves into a broader spectrum of expressive model families, including semi-parametric models [4,3], memory-augmented models [7], latent variable models [6] and energy-based models [10].
- To tackle the biases inherent in the conventional MLE objective, my research introduces novel training objectives [9, 11] and decoding frameworks [10], which are both theoretically grounded and practically accessible, aiming to achieve better alignment with human language.

Education

Tsinghua University, Beijing, China — September 2020 - Present
Ph.D. Student, Computer Science and Technology
Advisor: Minlie Huang

Tsinghua University, Beijing, China — September 2016 - July 2020
B.E., Electronic Engineering

Preprints

[11] **Towards Efficient and Exact Optimization of Language Model Alignment**
Haozhe Ji, Cheng Lu, Yilin Niu, Pei Ke, Hongning Wang, Jun Zhu, Jie Tang, Minlie Huang
Preprint.

Publications

[10] **Language Model Decoding as Direct Metrics Optimization**
Haozhe Ji, Pei Ke, Hongning Wang, Minlie Huang
International Conference on Learning Representations (ICLR), 2024.

[9] **Tailoring Language Generation Models under Total Variation Distance**
Haozhe Ji, Pei Ke, Zhipeng Hu, Rongsheng Zhang, Minlie Huang
International Conference on Learning Representations (ICLR), 2023. (***Notable top 5%***)

[8] **Curriculum-Based Self-Training Makes Better Few-Shot Learners for Data-to-Text Generation**
Pei Ke, **Haozhe Ji**, Zhenyu Yang, Yi Huang, Junlan Feng, Xiaoyan Zhu, Minlie Huang
International Joint Conference on Artificial Intelligence (IJCAI), 2022.

[7] **LaMemo: Language modeling with look-ahead memory**
Haozhe Ji, Rongsheng Zhang, Zhenyu Yang, Zhipeng Hu, Minlie Huang
North American Chapter of the Association for Computational Linguistics (NAACL), 2022.

[6] **DiscoDVT: Generating Long Text with Discourse-Aware Discrete Variational Transformer**
Haozhe Ji, Minlie Huang
Empirical Methods in Natural Language Processing (EMNLP), 2021.

[5] **Jointgt: Graph-text joint representation learning for text generation from knowledge graphs**
Pei Ke, **Haozhe Ji**, Yu Ran, Xin Cui, Liwei Wang, Linfeng Song, Xiaoyan Zhu, Minlie Huang
Findings of the Association for Computational Linguistics (Findings of ACL), 2021.

[4] **Language generation with multi-hop reasoning on commonsense knowledge graph**
Haozhe Ji, Pei Ke, Shaohan Huang, Furu Wei, Xiaoyan Zhu, Minlie Huang
Empirical Methods in Natural Language Processing (EMNLP), 2020.

[3] **Generating commonsense explanation by extracting bridge concepts from reasoning paths**
Haozhe Ji, Pei Ke, Shaohan Huang, Furu Wei, Minlie Huang
Asia-Pacific Chapter of the Association for Computational Linguistics (AACL), 2020.

[2] **Sentilare: Linguistic knowledge enhanced language representation for sentiment analysis**
Pei Ke*, **Haozhe Ji***, Siyang Liu, Xiaoyan Zhu, Minlie Huang
Empirical Methods in Natural Language Processing (EMNLP), 2020.

[1] **Denoising distantly supervised open-domain question answering**
Yankai Lin, **Haozhe Ji**, Zhiyuan Liu, Maosong Sun
Annual Meeting of the Association for Computational Linguistics (ACL), 2018.

RESEARCH EXPERIENCE

CoAI Lab, **Tsinghua University** — September 2020 - July 2025 (Expected)
Ph.D. Candidate (Supervisor: Minlie Huang)

Natural Language Comupting group, **Microsoft Research Asia** — July 2019 - July 2020
Research Intern (Supervisors: Shaohan Huang, Furu Wei)

SERVICES

Reviewer/Program Committee: ACL, EMNLP, ARR, AAAI

AWARDS

First Prize, Comprehensive Scholarship, Tsinghua University 2022
First Prize, Comprehensive Scholarship, Tsinghua University 2021
First-Class Academic Scholarship, Tsinghua University 2017
Gold Medal, 32nd China Physics Olympiads (CPhO) 2015
Honor Roll of Distinction (Top 1%), American Mathematics Contest 12 (AMC12) 2015