

Jianzhu Yao

<https://yao-jz.github.io>

Email : cnyaojz@gmail.com

Mobile : +86-139-3693-8133

Research Interest

My primary research interests are in the fields of Natural Language Processing and Machine Learning, including conversational systems, consistent and faithful generation, and biomedical application. I am also very excited about the research field of *Language + {Multimodal Information, Knowledge, Memory, Mixture of Experts...}*.

Education

Tsinghua University

Sep 2019 – Present

Bachelor of Computer Science and Technology; GPA: 3.86/4.00

Beijing, China

Courses: Introduction to Machine Learning, Probability and Statistics, Introduction to Artificial Intelligence, Data Structures, Linear Algebra, Object-Oriented Programming, Operating Systems, Compiler, Computer Architecture, Software Engineering, Network

Publications

- **A Benchmark for Understanding and Generating Dialogue between Characters in Stories**

Jianzhu Yao, Ziqi Liu, Jian Guan, Minlie Huang

EMNLP 2022, under review

- **EVA2.0: Investigating Open-Domain Chinese Dialogue Systems with Large-Scale Pre-Training**

Yuxian Gu, Jiabin Wen, Hao Sun, Yi Song, Pei Ke, Chujie Zheng, Zheng Zhang, *Jianzhu Yao*, Xiaoyan Zhu, Jie Tang, Minlie Huang

arXiv:2203.09313

Research Experience

Wang Lab, University of Washington, Seattle

Jul 2022 – Present

Research Assistant

Remote

- Utilized biomedical knowledge base to retrieve extra information, and implemented Graph Convolutional Network on the relation graph in order to generate more faithful and accurate terminology definition.
- Designed terminology definition generation evaluation metrics focused on the faithfulness and factuality, considering existing automatic evaluation metrics' bad performance.

Natural Language Computing Group, Microsoft Research Asia

Mar 2022 – Jun 2022

Research Intern

Beijing, China

- Conducted profiling experiments of Mixture of Experts models with different numbers of experts and devices to observe the computing cost trend of all2all communication.
- Explored expert pruning algorithms on the Mixture of Experts language models in order to speed up computation, lower computation latency, and reduce GPU memory usage.

Conversational AI Group, Tsinghua University

Jul 2021 – Mar 2022

Research Assistant

Beijing, China

- Independently designed a benchmark for dialogue understanding and generation between characters in stories, and a character-modeling approach for those tasks.
- Collaborated with team members on the development of the Open-Domain Chinese Dialogue System EVA1.0 and EVA2.0, and responsible for decoding strategies.
- Trained and implemented a contradiction detection classifier (RoBERTa) for Chinese Dialogue Systems, and designed the regeneration pipeline in order to avoid the inconsistent generation.

Graphics & Geometric Computing Group, Tsinghua University

2021

Research Assistant

Beijing, China

- Researched on rotation invariance of image local features in object reconstruction based on deep learning methods and traditional algorithms.
- Observed the effect of image transformation (like rotation, style transformation, affine transformation, stretching) on feature extraction and matching in SuperPoint, D2-Net, SuperGlue, and SIFT.

Selected Projects

- **Gym Reservation Script(Python, Selenium, PhantomJS, Shell, Wireshark)**: Developed a script using Python and PhantomJS to register for a timeslot at gym with captured cookie by Wireshark. (May 2021)
- **K-Means Clustering on MNIST(Python, K-Means, NumPy, Matplotlib, sklearn)**: Implemented K-Means Clustering Algorithm on MNIST dataset. (Apr 2022)
- **Ensemble Learning Experiment on Spam Classification(Python, SVM, Decision-Tree, Bagging, AdaBoost)**: Incorporated SVM and Decision-Tree with ensemble learning method Bagging and AdaBoost for spam classification. (May 2022)
- **Four-in-a-row AI Bot(C++, Monte Carlo Tree Search, Upper Confidence Bound Apply to Tree)**: Designed an AI bot with MCTS and UCB algorithm to compete with other AI bots of Four-in-a-row game. (May 2022)
- **Enterprise personnel permissions Management System(Vue, JavaScript, Front-end)**: Developed a front-end service for the management of personnel permissions in an enterprise(Kuaishou). (Nov 2021)
- **Education platform app based on knowledge graph(Java, SpringBoot, Android Studio, Full-stack)**: Developed the Front-end and Back-end educational application IntelEdu based on knowledge graph with a semantic similarity classifier(BERT). (Aug 2021)
- **KD-Tree based Stochastic Progressive Photon Mapping image rendering framework(C++)**: Implemented the SPPM algorithm, KD-Tree based Bounding Box for intersection acceleration, 3-d scene construction, anti-aliasing, motion blur, etc. (May 2021)

Services and Membership

- EMNLP 2022 Review Committee for the track Dialogue and Interactive Systems, Jul. 2022
- Member of the Bodybuilding Team of Tsinghua University, 2022 – Present
- Member of the Winter Swimming Association of Tsinghua University, 2021 – Present
- Member of Tsinghua University Admission Group in Heilongjiang Province, Jun. 2020
- Member of Student Association for Science and Technology, Dept. CST of Tsinghua University, 2020 – Present
- Member of Swimming Team of CST in Tsinghua University, 2019 – 2019

Workshops

Multimodal Machine Learning + Mixture of Experts

June 2022

Participant

Beijing, China

- Did a literature survey, and gave a presentation on the multimodal machine learning: Hierarchical Overview of Multimodal Machine Learning — And potential ideas with personal insights. [[slides](#)]
- Inspired by multimodal + MoE, designed experiments for Multitask Multimodal MoE, and wrote a research proposal: MMMoE: Advancing Multimodal Mixture-of-Experts Architecture to Power Next-Generation Multimodal Paradigm. [[pdf](#)] [[slides](#)]

Technical Skills

Programming Languages: Python, Latex, Java, C, C++, C#, Shell, HTML/CSS, MATLAB, Assembly(RISC-V, x86)

Developer Tools: VS Code, PyCharm, Git, Docker, Linux, Xcode, Unity Hub, Vim, Android Studio, Vivado, Quartus

Libraries/Frameworks: PyTorch, Transformers, Fairseq, spaCy, CoreNLP, NumPy, Matplotlib, Jupyter Notebook, Scikit, Keras, Django, SpringBoot, Vue

Soft Skills: Critical Thinking, Event Management, Presentation, Paper Writing, Time Management, Teamwork

Honors / Awards

- Academic Excellence Award, Tsinghua University, 2020
- 37th National Physics Competition for College Students in Beijing, China, First Prize, 2021
- The first prize of Engineering Technology Challenge, Tsinghua University, 2019
- The first prize of the Province Degree in the national Physic competition (senior group), 2018

Volunteer Service

- **Program Buddy**: Providing programming guidance for students not from institute of information. (2020, 2021)
- **The 110th anniversary of Tsinghua University**: Providing reception services. (2021)
- **International Collegiate Competition for Brain-inspired Computing**: Tournament service staff. (2019)