Bingsheng "Arthur" Yao

5th-year Ph.D. Student in Computer Science

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Research Focus

My research interests lie at the intersection of **NLP** and **HCI**. My primary focus is to **actively enhance machine reasoning with human rationales**. I further commit to investigate and address **real-world human needs** across a range of professional domains, with the ultimate goal of fostering **human-centered AI collaborations**.

Education

Ph.D. in Computer Science (Advisor: Prof. Jim Hendler)
Rensselaer Polytechnic Institute

📅 **Sep 2019 - Jan 2024**

MS in Information Technology and Web Science
Rensselaer Polytechnic Institute

📅 **Sep 2018 - May 2019**

BS in Computer System Engineering
Rensselaer Polytechnic Institute

📅 **Sep 2014 - May 2018**

Professional Experience

Postdoctoral Scholar (PI: Prof. Dakuo Wang)

Northeastern University

📅 **Starting in early 2024**

Artificial Intelligence Research Collaboration Fellowship

Rensselaer Polytechnic Institute   IBM Research

📅 **Aug 2022 - Aug 2023**

- Proposed a novel metric upon the Simulatability Score to faithfully evaluate human-annotated natural language explanations   [P.5]
- Designed a novel Active Learning framework and a similarity-based data selector for natural language explanations generation   [P.7]
- Facilitated LLM's few-shot in-context demonstration weak-supervision and selection   [P.17]

Summer Research Externship

Rensselaer Polytechnic Institute   IBM Research

📅 **May 2022 - Aug 2022**

- Implemented a novel QA-pair Generation (QAG) pipeline with a heuristics-based answer extraction module, a BART QG model, and a DistilBERT ranking module.   [P.2]
- Proposed FairytaleQA, a large-scale, experts-annotated dataset with 10, 580 QA-pairs on 278 fairytale stories, targeting children's reading comprehension   [P.3]
- Developed an interactive story-telling web application built upon our QAG system with a user study on 12 pairs of parents and children   [P.4]

Honors

Member of Upsilon Pi Epsilon
The International Honor Society for the Computing and Information Disciplines

📅 **Sep 2019 - present**

Member of Gamma Nu Eta
The National Information Technology Honor Society

📅 **Sep 2019 - present**

Publications (Peer-Reviewed)

[P.10] **"It's a Fair Game", or Is It? Examining How Users Navigate Disclosure Risks and Benefits When Using LLM-Based Conversational Agents**
Zhiping Zhang, Michelle Jia, Hao-Ping (Hank) Lee, Bingsheng Yao, Sauvik Das, Ada Lerner, Dakuo Wang, Tianshi Li
CHI 2024

[P.9] **Rethinking Human-AI Collaboration in Complex Medical Decision Making: A Case Study in Sepsis Diagnosis**
Shao Zhang, Jianing Yu, Xuhai Xu, Changchang Yin, Yuxuan Lu, Bingsheng Yao, Melanie Tory, Lace M. Padilla, Jeffrey Caterino, Ping Zhang, Dakuo Wang
CHI 2024

[P.8] **Mental-LLM: Leveraging Large Language Models for Mental Health Prediction via Online Text Data**
Xuhai Xu, Bingsheng Yao, Yuanzhe Dong, Saadia Gabriel, Hong Yu, James Hendler, Marzyeh Ghassemi, Anind K Dey, Dakuo Wang
IMWUT 2024

[P.7] **Beyond Labels: Empowering Human with Natural Language Explanations through a Novel Active-Learning Architecture**
Bingsheng Yao, Ishan Jindal, Lucian Popa, Yannis Katsis, Sayan Ghosh, Lihong He, Yuxuan Lu, Shashank Srivastava, James Hendler, Dakuo Wang
EMNLP 2023 Findings

[P.6] **`Don't Get Too Technical with Me': A Discourse Structure-Based Framework for Automatic Science Journalism**
Ronald Cardenas, Bingsheng Yao, Dakuo Wang, Yufang Hou
EMNLP 2023

[P.5] **Are Human Explanations Always Helpful? Towards Objective Evaluation of Human Natural Language Explanations**
Bingsheng Yao, Prithviraj Sen, Lucian Popa, James Hendler, Dakuo Wang
ACL 2023 Oral Presentation

[P.4] **StoryBuddy: A Human-AI Collaborative Chatbot for Parent-Child Interactive Storytelling with Flexible Parental Involvement**
Zheng Zhang*, Ying Xu*, Yanhao Wang, Bingsheng Yao, Daniel Ritchie, Tongshuang Wu, Mo Yu, Dakuo Wang, Toby Jia-Jun Li
CHI 2022 - Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems

[P.3] **Fantastic Questions and Where to Find Them: FairytaleQA -- An Authentic Dataset for Narrative Comprehension**
Ying Xu*, Dakuo Wang*, Mo Yu*, Daniel Ritchie*, Bingsheng Yao*, Tongshuang Wu, Zheng Zhang, Toby Jia-Jun Li, Nora Bradford, Branda Sun, Tran Bao Hoang, Yisi Sang, Yufang Hou, Xiaojuan Ma, Diyi Yang, Nanyun Peng, Zhou Yu, Mark Warschauer
ACL 2022 - Proceedings of the 60th Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)

[P.2] **It is AI's Turn to Ask Humans a Question: Question-Answer Pair Generation for Children's Story Books**
Bingsheng Yao*, Dakuo Wang*, Tongshuang Wu, Tran Hoang, Branda Sun, Toby Jia-Jun Li, Mo Yu, Ying Xu
ACL 2022 - Proceedings of the 60th Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)

[J.1] **Narrative Question Answering with Cutting-Edge Open-Domain QA Techniques: A Comprehensive Study**
Xiangyang Mou*, Chenghao Yang*, Mo Yu*, Bingsheng Yao, Xiaoxiao Guo, Saloni Potdar, Hui Su
TACL 2021 - Transactions of the Association for Computational Linguistics, Volume 9

Publications (Peer-Reviewed) Cont.

[P.1]   **Trust in AutoML: exploring information needs for establishing trust in automated machine learning systems**
Jaimie Drozdal, Justin Weisz, Dakuo Wang, Gaurav Dass, Bingsheng Yao, Changruo Zhao, Michael Muller, Lin Ju, Hui Su
IUI 2020 - Proceedings of the 25th International Conference on Intelligent User Interfaces

Publications (In Submission)