

# Bingsheng “Arthur” Yao

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

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[/WorkInTheDark](#)

## 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 - present

**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

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## Publications (Peer-Reviewed)

- [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
- [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
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## Publications (In Submission)

- [P.17] **More Samples or More Prompt Inputs? Exploring Effective In-Context Sampling for LLM Few-Shot Prompt Engineering**  
*Bingsheng Yao*, Guiming Chen, Ruishi Zou, Yuxuan Lu, Jiachen Li, Shao Zhang, Sijia Liu, James Hendler, Dakuo Wang  
[In Submission](#)
- [P.16] **Human Still Wins over LLM: An Empirical Study of Active Learning on Domain-Specific Annotation Tasks**  
Yuxuan Lu, *Bingsheng Yao*, Shao Zhang, Yun Wang, Peng Zhang, Tun Lu, Toby Jia-Jun Li, Dakuo Wang  
[In Submission](#)
- [P.15] **"Mango Mango, How to Let The Lettuce Dry Without A Spinner?": Exploring User Perceptions of Using An LLM-Based Conversational Assistant Toward Cooking Partner**  
Szeyi Chan, Jiachen Li, *Bingsheng Yao*, Amama Mahmood, Chien-Ming Huang, Holly Jimison, Elizabeth D Mynatt, Dakuo Wang  
[In Submission to CHI 2024 - Under Review](#)
- [P.14] **LLM-Powered Conversational Voice Assistants: Interaction Patterns, Opportunities, Challenges, and Design Guidelines**  
Amama Mahmood, Junxiang Wang, *Bingsheng Yao*, Dakuo Wang, Chien-Ming Huang  
[In Submission to CHI 2024 - Under Review](#)
- [P.13] **"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  
[In Submission to CHI 2024 - Under Review](#)
- [P.11] **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  
[In Submission to CHI 2024 - Under Review](#)
- [P.10] **Talk2Care: Facilitating Asynchronous Patient-Provider Communication with Large-Language-Model**  
Ziqi Yang, Xuhai Xu, *Bingsheng Yao*, Shao Zhang, Ethan Rogers, Stephen Intille, Nawar Shara, Dakuo Wang  
[In Submission to CHI 2024 - Under Review](#)
- [P.9] **FairytaleCQA: A Dataset for Narrative Comprehension with External Commonsense Knowledge for Children Education**  
Jiaju Chen, Yuxuan Lu, Shao Zhang, *Bingsheng Yao*, Yuanzhe Dong, Ying Xu, Yunyao Li, Dakuo Wang, Yuling Sun  
[In Submission](#)
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