

YUTING NING

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RESEARCH INTERESTS

Natural Language Processing; Data Mining; NLP for Intelligent Education

EDUCATION

University of Science and Technology of China 09/2021 - 06/2024 (expected)

M.S. in Computer Science and Technology

Advisor: **Enhong Chen**

GPA: 4.11 / 4.3 (Ranking: 1/116)

University of Science and Technology of China 09/ 2017 - 06/2021

B.S. in Computer Science and Technology

GPA: 3.93 / 4.3 (Ranking: 5/253)

RESEARCH EXPERIENCE

University of Southern California 07/2023 - Present

Visiting Student, **INK Lab**, Advisor: **Xiang Ren** Los Angeles, CA

- **Project:** Long-tail Knowledge Generation
 - Proposed a logic-induced knowledge search framework LINK for systematically generating long-tail knowledge statements.
 - Constructed a dataset LINT with 40K knowledge statements using the framework.
 - Evaluated the generation and reasoning abilities of LLMs on long-tail distribution.

University of Science and Technology of China 09/2021 - Present

Graduate Research Assistant, **BDAA-BASE Group**, Advisor: **Enhong Chen** Hefei, China

- **Project:** Natural Language Processing in Intelligent Education
 - Improved the understanding of educational resources, especially mathematical problems.
 - Designed a contrastive pre-training method for holistically understanding mathematical questions.
 - Proposed a prompt-guided auto-formulation framework for optimization problems.
- **Project:** Evaluation of Large Language Models
 - Proposed an adaptive testing framework for effective LLM evaluation, which dynamically selects the following test questions based on the current model performance.
 - Conducted fine-grained diagnostics of LLMs from three aspects of human-level abilities.

Microsoft Research Asia 07/2020 - 12/2020

Research Intern, **Social Computing Group**, Mentor: **Fangzhao Wu** and **Xing Xie** Beijing, China

- **Project:** News Understanding and Recommendation
 - Developed multilingual news recommendation models for MSN online services.
 - Improved the news encoder with multi-view learning and the user encoder with multi-platform behaviors.

University of Science and Technology of China 03/2020 - 07/2020

Undergraduate Research Assistant, Advisor: **Qi Liu** Hefei, China

- **Project:** Federated User Modeling
 - Proposed a hierarchical personalized federated user modeling framework, which considers the statistical heterogeneity, privacy heterogeneity and model heterogeneity of inconsistent clients.

PREPRINTS

1. **Yuting Ning**, Jiayu Liu, Longhu Qin, Tong Xiao, Shangzi Xue, Zhenya Huang, Qi Liu, Enhong Chen, Jinze Wu. A Novel Approach for Auto-Formulation of Optimization Problems. *arXiv preprint*, 2023. [PDF] [Code]

2. Huihan Li, **Yuting Ning***, Zeyi Liao*, Siyuan Wang, Xiang Lorraine Li, Ximing Lu, Faeze Brahman, Wenting Zhao, Yejin Choi, Xiang Ren. In Search of the Long-Tail: Systematic Generation of Long-Tail Knowledge via Logical Rule Induced Search. *Submitted to ICLR2024*, 2023. [PDF] [Code] [Dataset]
3. Yan Zhuang, Qi Liu, **Yuting Ning**, Weizhe Huang, Rui Lv, Zhenya Huang, Guanhao Zhao, Zheng Zhang, Qingyang Mao, Shijin Wang, Enhong Chen. Efficiently Measuring the Cognitive Ability of LLMs: An Adaptive Testing Perspective. *Submitted to ICLR2024*, 2023. [PDF]

PUBLICATIONS

1. **Yuting Ning**, Zhenya Huang, Enhong Chen, Shiwei Tong, Zheng Gong, Shijin Wang. Towards a Holistic Understanding of Mathematical Questions with Contrastive Pre-training. *The 37th AAAI Conference on Artificial Intelligence (AAAI)*, 2023. [PDF] [Code]
2. Qi Liu, Jinze Wu, Hao Wang, Zhenya Huang, **Yuting Ning**, Ming Chen, Enhong Chen. Federated User Modeling from Hierarchical Information. *ACM Transactions on Information Systems (TOIS)*, 2023. [PDF]
3. Zheng Gong, Guifeng Wang, Ying Sun, Qi Liu, **Yuting Ning**, Hui Xiong, Jingyu Peng. Beyond Homophily: Robust Graph Anomaly Detection via Neural Sparsification. *32nd International Joint Conference on Artificial Intelligence (IJCAI2023)*, 2023. [PDF]
4. Ye Liu, Han Wu, Zhenya Huang, Hao Wang, **Yuting Ning**, Jianhui Ma, Qi Liu, Enhong Chen. TechPat: Technical Phrase Extraction for Patent Mining. *ACM Transactions on Knowledge Discovery from Data (TKDE)*, 2023. [PDF]
5. Jinze Wu, Qi Liu, Zhenya Huang, **Yuting Ning**, Hao Wang, Enhong Chen, Jinfeng Yi and Bowen Zhou. Hierarchical Personalized Federated Learning for User Modeling. *The 30th International World Wide Web Conference (WWW)*, 2021. [PDF]
6. **Yuting Ning**, Ye Liu, Zhenya Huang, Haoyang Bi, Qi Liu, Enhong Chen, Dan Zhang. Stable and Diverse: A Unified Approach for Computerized Adaptive Testing. *2021 IEEE 7th International Conference on Cloud Computing and Intelligent Systems (CCIS)*, 2021. [PDF]

PROJECTS

- EduNLP** [Code] [Doc] 09/2021 - Present
- Led the project and aimed at an advanced and unified NLP library for multi-model educational resources.
 - Implemented several educational question representation models and pre-training methods.
 - Built the ModelHub to effectively manage the pre-trained models.
- Intelligent Education Knowledge Graph (LUNA)** [Web] 02/2021 - 07/2023
- Aiming to analyze massive educational resources deeply and provide intelligent education services.
 - Developed the question search service and empowered question-based services with pre-trained LMs.

TEACHING EXPERIENCE

- Machine Learning and Knowledge Discovery** 09/2022 - 02/2023
Teaching Assistant, University of Science and Technology of China

AWARDS

- First Prize Academic Scholarship**, University of Science and Technology of China 2021, 2022, 2023
- 3rd place in NeurIPS Competition: Natural Language for Optimization** [Web] 2022
- Silver Prize (top 5%) in Kaggle Competition: Feedback Prize - Evaluating Student Writing** [Web] 2022
- Top 5% Outstanding Graduates of USTC**, University of Science and Technology of China 2021
- 2nd place in MOOCube Competition: Predicting Student Performances** 2021
- Baosteel Outstanding Student Scholarship** (1/1800+ in USTC), Baosteel Education Fund 2020
- National Scholarship**, Ministry of Education of the People's Republic of China 2019