

# Xuye Liu

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## Research interests

Natural Language Processing, Multimodal Learning, Human-Computer Interaction,  
Human-Ai-Collaboration, Programming Support Tools

## Education

- Sep 2021 – Present    **University of Waterloo** – Waterloo, Canada  
Ph.D. in Computer Science  
Advisor: Jian Zhao, Tengfei Ma
- Aug 2019 – Jan 2021    **Rensselaer Polytechnic Institute** – Troy, U.S.A  
Master of Science in Information Technology and Computer Science  
GPA: 3.83/4.0
- Sept 2015 – Jun 2019    **Jilin University** – China  
Bachelor of Computer Engineering

## Honors and Scholarships

- 2023-2024    Mitacs Accelerate Fellowship, Blackberry
- 2021-2024    International Doctoral Student Award, University of Waterloo
- 2015-2019    Award for Excellence in Academic Performance, Jilin University

## Publications

\* Equal Contribution

- 2024[P.8]    **Influencer: Empowering Everyday Users in Creating Promotional Posts via AI-infused Exploration and Customization**  
Xuye Liu, Annie Sun, Pengcheng An, Tengfei Ma, Jian Zhao  
*Under review at CHI2025*
- 2024[P.7]    **EASIER: Relevance-Boosted Captioning and Structural Information Extraction for Zero-Shot Video-Text Retrieval**  
Xuye Liu, Yimu Wang, Wei Pang, Xiangru Jian, Jian Zhao  
*Under review at EMNLP2025*

- 2024[P.6]     **nbDescrib: A Dataset for Text Description Generation from Tables and Code in Jupyter Notebooks with Guidelines**  
Xuye Liu, Tengfei Ma, Yimu Wang, Fengjie Wang, Jian Zhao  
*Under review at COLING2025*
- 2023[P.5]     **Slide4N: Creating Presentation Slides from Computational Notebooks with Human-AI Collaboration**  
Fengjie Wang\*, **Xuye Liu**\*, Oujing Liu, Ali Neshati, Tengfei Ma, Min Zhu, Jian Zhao  
*In Proceedings of the ACM CHI Conference on Human Factors in Computing Systems (CHI 2023)*
- 2021[P.4]     **HAConvGNN: Hierarchical Attention Based Convolutional Graph Neural Network for Code Documentation Generation in Jupyter Notebooks**  
**Xuye Liu**, Dakuo Wang, April Yi Wang, Yufang Hou, Lingfei Wu.  
*In Proceedings of the 2021 Conference on Empirical Methods in Natural Language Processing: (EMNLP 2021).*
- 2021[P.3]     **Documentation Matters: Human-Centered AI System to Assist Data Science Code Documentation in Computational Notebooks**  
April Yi Wang, Dakuo Wang, Jaimie Drozdal, Michael Muller, Soya Park, Justin D. Weisz, **Xuye Liu**, Lingfei Wu, Casey Dugan.  
*ACM Transactions on Computer-Human Interaction (TOCHI 2021).*
- 2021[P.2]     **Graph-Augmented Code Summarization in Computational Notebooks**  
April Y. Wang, Dakuo Wang, **Xuye Liu**, Lingfei Wu.  
*In Proceedings of 30th International Joint Conferences on Artificial Intelligence (IJCAI 2021).*
- 2021[P.1]     **How Data Scientists Improve Generated Code Documentation in Jupyter Notebooks**  
Michael Muller, April Yi Wang, Steven I. Ross, Justin D. Weisz, Mayank Agarwal, Kartik Talamadupula, Stephanie Houde, Fernando Martinez, John Richards, Jaimie Drozdal, **Xuye Liu**, David Piorkowski, Dakuo Wang.  
*Workshop on Human-AI Co-Creation with Generative Models at ACM Conference on Intelligent User Interface (IUI 2021).*

## Patents

- 2020     **Learning-Based Automated Machine Learning Code Annotation in Computational Notebooks**  
Dakuo Wang, Lingfei Wu, Yi Wang, **Xuye Liu**, Chuang Gan, Si Er Han, Bei Chen, Ji Hui Yang.  
Filed 2020. 17/069402.
- 2020     **Learning-Based Automated Machine Learning Code Annotation with Graph Neural Network**  
Dakuo Wang, Lingfei Wu, **Xuye Liu**, Yi Wang, Chuang Gan, Jing Xu, Xue Ying Zhang, Jun Wang, Jing James Xu.  
Filed 2020. 17/088018.
- 2016     **Dots and Box V1.0**  
Xuye Liu, Anbo Liu, Xueqi Wu.  
2016SR366619.

2018 **Intelligent Reconstruction System of Three-Dimensional House Plan V1.0**  
Yi Xiao, Xuye Liu, Pan Li, Shuai Wang, Lingyun Zeng.  
2018SR450413.

## Work Experience

- Sep 2021 – Present **Graduate Research Assistant, University of Waterloo**  
Advisor: [Jian Zhao](#), [Tengfei Ma](#)  
Topic: Design, develop, and evaluate interactive systems for code developers. [P.5, P.6, P.7, P.8]
- Developed an AI-driven interface to enable users without design expertise to create customized promotional posts, enhancing user creativity through an AI-infused, interactive system. *(React.js, Flask, UI/UX Design)*
  - Created a relevance-boosting caption generation and structural extraction system for zero-shot video-text retrieval, significantly improving retrieval accuracy. *(Python, Multimodal Learning)*
  - Built a large-scale dataset and workflow to enable text description generation from tables and code, tailoring guidelines to improve model precision in Jupyter Notebooks. *(Python, NLP)*
  - Led a project integrating human-AI collaboration to create presentation slides from computational notebooks, enhancing accessibility and clarity for technical presentations. *(React.js, Flask, Human-AI Collaboration)*
- May 2020 – Aug 2020 **Research Intern, AI Interaction, IBM Research** – Massachusetts  
Advisor: [Dakuo Wang](#), [Lingfei Wu](#)  
Topic: Code Documentation Generation & Human-centric programming. [P.1, P.2, P.3, P.4]
- Designed and implemented an auto code summary generation feature covering data aggregation, preprocessing, model building, GUI design, and user experience evaluation for the IBM AutoAI platform.
  - Developed a GNN-based model to generate code summaries, achieving a 15% ROUGE-LCS score improvement, which helped engineers understand code and produce reports faster. *(Python, PyTorch, NLP)*
  - Collaborated with engineers for full-stack development of the AutoAI platform, using *(React, Flask, and NodeJS)*.
  - Earned high ratings from my mentor and other engineers for strong analytical skills, efficiency, and effective communication.
- Jan 2020 – May 2020 **Software Engineer, United Airlines, U.S.A**  
Topic: Recommendation Algorithm
- Designed a user-based collaborative filtering algorithm to recommend products for users based on their spending history and other similar users, helping low-frequency users spend more miles. *(Python)*
  - Built a full-stack application to visualize results. Designed a graphical user interface (GUI) for improved communication with users, deployed on AWS EC2 for client testing, and enhanced the design. *(Vue.js, Flask)*

## Teaching Experience

Sep 2021 – Present	<b>Teaching Assistant, University of Waterloo</b>
Jan 2020 – Sep 2020	<b>Teaching Assistant, Rensselaer Polytechnic Institute</b>

## Services

### **Paper Review**

EMNLP, ACL, NAACL, CHI, CHI LBWs, VIS

## Technical Skills

### **Programming languages**

Proficient in: Python, HTML/CSS/JavaScript, C/C++, Java, C++

Framework: PyTorch, React.js, Flask, Tensorflow

### **Software**

Git, Visual Studio, AWS, Android Studio, Eclipse, Docker

### **Languages**

English (fluent), Chinese (native)