

Jiaying Lu

Assistant Professor
Center for Data Science
Nell Hodgson Woodruff School of Nursing, Emory University

Updated: 2024-06-21

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EDUCATION BACKGROUNDS

- Ph.D. [Computer Science & Informatics](#), Emory University, USA, 2019–2024
Dissertation: Learning Structured Knowledge from Real-World Data without Excessive Annotations
Advisor: [Dr. Carl Yang](#)
- M.Eng. Electronics & Communication Engineering, Beijing University of Posts and Telecommunications, China, 2014–2017
Exchange student at Aalto University, Finland, Sep 2015–Jan 2016
- B.Sc. Information Engineering, Beijing University of Posts and Telecommunications, China, 2010–2014

ACADEMIC APPOINTMENTS

- 2024– [Center for Data Science](#), Nell Hodgson Woodruff School of Nursing, Emory University.
Research-Track Assistant Professor

HONORS & AWARDS

- 2024 **Young Scientist Excellence Awards** (4th-place winner). *MidSouth Computational Biology and Bioinformatics Society*. Atlanta, GA, USA.
- 2022 NSF Registration Award. *31st ACM International Conference on Information and Knowledge Management*. Atlanta, GA, USA.
- 2022 NSF Student Travel Award. *28th ACM SIGKDD Conference on Knowledge Discovery and Data Mining*. Washington, D.C., USA.
- 2022 Registration Award. *Georgia Statistics Day 2022*. Athens, GA, USA.
- 2021–24 Emory Professional Development Support Funds. *The James T. Laney School of Graduate Studies*. Atlanta, GA, USA.

GRANTS

Ongoing Research Support

- 2024–26 *Incorporating Structured Knowledge in Large Language Models for Precision Healthcare* (Lu)
Emory Nursing Data Science Foundation
Role: Principal Investigator

PUBLICATIONS

Journal Articles

- 2023 **Jiaying Lu**, Xiangjue Dong, and Carl Yang. Weakly supervised concept map generation through task-guided graph translation. *IEEE Transactions on Knowledge and Data Engineering*, 35(10): 10871–10883, March 2023a. doi: 10.1109/TKDE.2023.3252588
- 2023 Wenjing Ma, **Jiaying Lu**, and Hao Wu. Cellcano: supervised cell type identification for single cell atac-seq data. *Nature Communications*, 14(1):1864, April 2023. ISSN 2041-1723. doi: 10.1038/s41467-023-37439-3 (2023 **ASA SSGG Distinguished Student Paper Award**)

Conference Proceedings

- 2024 Yuzhang Xie, **Jiaying Lu**, Joyce Ho, Fadi Nahab, Xiao Hu, and Carl Yang. Promptlink: Leveraging large language models for cross-source biomedical concept linking. In *47th International ACM SIGIR Conference on Research and Development in Information Retrieval - Short Paper*, SIGIR'24, July 2024
- 2024 **Jiaying Lu**, Shifan Zhao, Wenjing Ma, Hui Shao, Xiao Hu, Yuanzhe Xi, and Carl Yang. Uncertainty-aware pre-trained foundation models for patient risk prediction via gaussian process. In *The ACM Web Conference 2024 (HealthDay Track)*, WWW-HealthDay'24, May 2024b (**2024 MCBIOS Young Scientist Excellence Awards**)
- 2024 Zhaoliang Chen, Cheng Ding, Nirbhay Modhe, **Jiaying Lu**, Carl Yang, and Xiao Hu. Adapting a generative pretrained transformer achieves sota performance in assessing diverse physiological functions using only photoplethysmography signals: A gpt-ppg approach. In *AAAI 2024 Spring Symposium on Clinical Foundation Models*, February 2024
- 2024 **Jiaying Lu**, Jinmeng Rao, Kezhen Chen, Xiaoyuan Guo, Yawen Zhang, Baochen Sun, Carl Yang, and Jie Yang. Evaluation and enhancement of semantic grounding in large vision-language models. In *AAAI 2024 Workshop on Responsible Language Models*, ReLM'24, February 2024a (**Spotlight**)
- 2024 Zhexiong Liu, Jing Zhang, **Jiaying Lu**, Wenjing Ma, and Joyce Ho. Logicprpbank: A corpus for logical implication and equivalence. In *AAAI 2024 Workshop on AI for Education*, AAAI-AI4ED'24, February 2024b
- 2023 **Jiaying Lu**, Yongchen Qian, Shifan Zhao, Yuanzhe Xi, and Carl Yang. Mug: A multimodal classification benchmark on game data with tabular, textual, and visual fields. In *Findings of the Association for Computational Linguistics: EMNLP 2023*, Findings-EMNLP'23, December 2023b. doi: 10.18653/v1/2023.findings-emnlp.354
- 2023 Hejie Cui, **Jiaying Lu**, Shiyu Wang, Ran Xu, Wenjing Ma, Shaojun Yu, Yue Yu, Xuan Kan, Chen Ling, Joyce Ho, et al. A survey on knowledge graphs for healthcare: Resources, applications, and promises. In *ICML 2023 Workshop on Interpretable Machine Learning in Healthcare*, IMLH@ICML'23, July 2023
- 2023 **Jiaying Lu**, Jiaming Shen, Bo Xiong, Wenjing Ma, Staab Steffen, and Carl Yang. Hiprompt: Few-shot biomedical knowledge fusion via hierarchy-oriented prompting. In *46th International ACM SIGIR Conference on Research and Development in Information Retrieval - Short Paper*, SIGIR'23, April 2023c. doi: 10.1145/3539618.3591997
- 2023 Xiangjue Dong, **Jiaying Lu**, Jianling Wang, and James Caverlee. Closed-book question generation via contrastive learning. In *17th Conference of the European Chapter of the Association for Computational Linguistics*, EACL'23, May 2023. doi: 10.18653/v1/2023.eacl-main.230
- 2022 **Jiaying Lu** and Carl Yang. Open-world taxonomy and knowledge graph co-learning. In *4th Conference on Automated Knowledge Base Construction*, AKBC'22, November 2022
- 2022 **Jiaying Lu**, Xin Ye, Yi Ren, and Yezhou Yang. Good, better, best: Textual distractors generation for multi-choice VQA via policy gradient. In *CVPR 2022 Workshop on Open-Domain Retrieval Under a Multi-Modal Setting*, O-DRUM@CVPR'22, June 2022. doi: 10.1109/CVPRW56347.2022.00539
- 2022 Hejie Cui, **Jiaying Lu**, Yao Ge, and Carl Yang. How can graph neural networks help document retrieval: A case study on cord19 with concept map generation. In *44th European Conference on Information Retrieval - Short Paper*, ECIR'22, April 2022. doi: 10.1007/978-3-030-99739-7_9
- 2021 **Jiaying Lu** and Jinho D. Choi. Evaluation of Unsupervised Entity and Event Saliency Estimation. In *Proceedings of the 34rd International Florida Artificial Intelligence Research Society Conference*, FLAIRS'21, May 2021. doi: 10.32473/flairs.v34i1.128482

Peer-reviewed Abstracts

- 2024 JH Yoon, D Liu, D Bold, **Lu, J**, R Xiao, C Ding, C Yang, G Clermont, and X Hu. Systematic evaluation of general large language models for contextually assessed semantic concepts from

unstructured critical care data. In *C22. ARTIFICIAL INTELLIGENCE IN THE ICU: THE MACHINE WILL SEE YOU NOW*, pages A5060–A5060. American Thoracic Society, 2024

Preprint Reports

- 2024 Shifan Zhao, **Lu, Jiaying**, Ji Yang, Edmond Chow, and Yuanzhe Xi. Efficient two-stage gaussian process regression via automatic kernel search and subsampling. *arXiv:2405.13785*, 2024
- 2024 Runze Yan, Hanqi Luo, **Lu, Jiaying**, Darren Liu, Terryl J Hartman, and Xiao Hu. Dietai24: A trustworthy dietary assessment framework with customizable multimodal large language models, 2024
- 2024 Darren Liu, Cheng Ding, Delgersuren Bold, Monique Bouvier, **Jiaying Lu**, Benjamin Shickel, Craig S. Jabaley, Wenhui Zhang, Soojin Park, Michael J. Young, Mark S. Wainwright, Gilles Clermont, Parisa Rashidi, Eric S. Rosenthal, Laurie Dimisko, Ran Xiao, Joo Heung Yoon, Carl Yang, and Xiao Hu. Evaluation of general large language models in contextually assessing semantic concepts extracted from adult critical care electronic health record notes. *arXiv:2401.13588*, 2024a
- 2024 Guangji Bai, Zheng Chai, Chen Ling, Shiyu Wang, **Jiaying Lu**, Nan Zhang, Tingwei Shi, Ziyang Yu, Mengdan Zhu, Yifei Zhang, Carl Yang, Yue Cheng, and Liang Zhao. Beyond efficiency: A systematic survey of resource-efficient large language models. *arXiv:2401.00625*, 2024
- 2023 Chen Ling, Xujiang Zhao, **Jiaying Lu**, Chengyuan Deng, Can Zheng, Junxiang Wang, Tanmoy Chowdhury, Yun Li, Hejie Cui, Tianjiao Zhao, et al. Beyond one-model-fits-all: A survey of domain specialization for large language models. *arXiv:2305.18703*, 2023

Patents

- 2023 Jinmeng Rao, **Jiaying Lu**, Kezhen Chen, Jie Yang, Yawen Zhang, Xiaoyuan Guo. “A Simulation-Feedback Frame-work to Mitigate Hallucinations in Multimodal Generative Models”. *Filed 2023. X-52882-00-US*.

INVITED TALKS

- 2024 “Mutual Enhancement of Structured Knowledge and Large Language Model for Health Informatics”. **Research Seminar**. Nell Hodgson Woodruff School of Nursing. Atlanta, GA, USA. Jan 9, 2024.
- 2023 “Retrieval Augmented Generation for Biomedical Entity Alignment via Large Language Models”. **Doctoral Symposium**. 2023 Conference on Health, Inference, and Learning. Boston, MA, USA, Jun 24, 2023.
- 2022 “Learning to Construct Structured Knowledge”. **Data Science Forum**. School of Data Science, The Chinese University of Hong Kong. Palo Alto, CA, USA. Dec 17, 2022.

TEACHING EXPERIENCES

- 2021 Teaching Assistant. *CS570 Data Mining*. Emory University.
- 2020 Teaching Assistant. *CS253 Data Structure and Algorithms*. Emory University.
- 2020 Teaching Assistant. *CS170 Introduction to Computer Science I*. Emory University.

PROFESSIONAL EXPERIENCES

- 2023 **AI Residency**. Mountain View, CA, USA. May–Sep 2023.
Mineral Research Team, **Google X**.
Supervisors: [Dr. Jinmeng Rao](#), [Dr. Kezhen Chen](#).
 - Data-centric approach for mitigating hallucination in multimodal large language models.
- 2022 **Applied Scientist Intern**. Sunnyvale, CA, USA. May–Aug 2022.
Auto Machine Learning Team, **Amazon.com**.
Supervisors: [Dr. Andrew Borthwick](#), [Nick Erickson](#).

- Multi-modal ensemble models for large-scale product classification problems.
- 2018–19 **Visiting Scholar**. Phoenix, AZ, USA. Aug 2018–Jan 2019.
[Active Perception Group](#), **Arizona State University**.
 Advisor: [Dr. Yezhou Yang](#).
- Research Interests: Visual Question Answering, Multimodal Learning.
- 2018 **NLP Engineer**. Beijing, China. Jan–Jul 2018.
 Search Engine Group. **Xiaomi**.
- Word segmentation, named entity recognition, unsupervised synonym pairs mining.
- 2016–17 **Machine Learning Engineer Full-Time & Intern**. Beijing, China. Oct 2016–Dec 2017.
 Search Advertising Group. **Baidu**.
- Ads content generation, Query-Ads matching.
- 2016 **Machine Learning Engineer Intern**. Beijing, China. Jul–Sep 2016.
 Growth Hacking Team. **Meituan**.
- Gradient boosted regression trees for new customer coupon distribution prediction.
- 2016 **Machine Learning Engineer Intern**. Beijing, China. Mar–Jun 2016.
 Online Food Delivery Group. **Baidu**.
- Logistic regression model for customer CTR prediction.
- 2014–15 **Software Engineer Intern**. Beijing, China. Sep 2014–Feb 2015.
 Beijing YunJiang Technology Co., Ltd.
- Web & mobile application backend development.

PROFESSIONAL MEMBERSHIPS

- 2024– Member, *Georgia Center for Diabetes Translation Research Data Repository*.
- 2023– Member, *Association for Computing Machinery*.
- 2024– Member, *Special Interest Group on Information Retrieval*.

SERVICES

Academic Event Organizations

- 2022 Web Developer Student Lead. *28th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*.

Journal Peer Reviews

- 2023– The Journal of Agricultural, Biological and Environmental Statistics (**JABES**).
- 2022– The IEEE Transactions on Neural Networks and Learning Systems (**TNNLS**).
- 2021 The IEEE Transactions on Knowledge and Data Engineering (**TKDE**).
- 2021 The IEEE Transactions on Big Data (**TBD**).

Conference Peer Reviews

- 2024 The Association for Computational Linguistics Rolling Review (**ACL Rolling Review**).
- 2023 The ACM Special Interest Group on Information Retrieval (**SIGIR**).
- 2021– The Conference on Empirical Methods in Natural Language Processing (**EMNLP**).

- 2023 The IEEE International Conference on Data Mining (**ICDM**).
- 2023 The IEEE International Conference on Bioinformatics and Biomedicine (**BIBM**).
- 2023 The Conference on Machine Learning for Health (**ML₄H**)
- 2022- The International World Wide Web Conference (**WWW**).
- 2022 The ACM Conference on Knowledge Discovery and Data Mining (**KDD**).
- 2022 The AAAI Conference on Artificial Intelligence (**AAAI**).
- 2021 The ACM International Conference on Information and Knowledge Management (**CIKM**).
- 2021 The International Joint Conference on Natural Language Processing (**IJCNLP**).
- 2020 The International Joint Conferences on Artificial Intelligence (**IJCAI**).
- 2019-23 The IEEE International Conference on Robotics and Automation (**ICRA**).

Symposium & Workshop Peer Reviews

- 2024 AAAI Spring Symposium on Clinical Foundation Models.
- 2023 NeurIPS Workshop on Socially Responsible Language Modelling Research (**SoLaR**).
- 2023 ICLR Workshop on Trustworthy Machine Learning for Healthcare (**TML₄H**).
- 2023- ACL SIGEDU Workshop on Innovative Use of NLP for Building Educational Applications (**BEA**).
- 2021- ICML Workshop on Interpretable Machine Learning in Healthcare (**IMLH**).
- 2021- ICCV Workshop on Computer Vision for Automated Medical Diagnosis (**CVAMD**).