MAN LUO

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EDUCATION

Ph.D. student, Computer Science *August 2018 - May 2023*
Arizona State University (ASU), Tempe, Arizona, USA
Thesis: Neural Retriever-Reader for Information Retrieval and Question Answering
Chair: Dr. Chitta Baral
Committee: Dr. Yezhou Yang, Dr. Eduardo Blanco, Dr. Danqi Chen

Bachelor of Science, Computer Science *September 2014 - July 2018*
Beijing Forestry University, Beijing, China

RESEARCH AREA

Retrieval-Augmented Language Models and Multimodal Understanding and Learning.

WORK EXPERIENCE

Research Fellow at Mayo Clinic *July 2023 - Present*
Conduct front-end research on developing language models and multimodal language models that can generalize to unseen domains and increase the interpretability of models.

Research Intern at Google Research *Sep 2022 - Dec 2022*
Utilized information retrieval models to enhance the few-shot in-context learning capabilities of large language models. Designed a retrieval model that achieved superior performance compared to existing models.

Research Intern at Meta Reality Lab *May 2022 - Aug 2022*
Developed an indexing-memory efficient hybrid retrieval model that improved generalization. Utilized adversarial attack methods to evaluate the robustness of various retrieval models.

Research Intern at Salesforce.Inc *May 2021 - Aug 2021*
Examined machine reading comprehension models, and evaluated the benefits and drawbacks of extractive and generative models through experimentation on 12 question answering datasets in both in-domain and out-of-domain scenarios.

TEACHING/MENTORING

ASU Capstone Project Mentor
Detect and rewrite the toxicity in paper reviews, 5 students, *Sep 2023 - Present*

Master Mentor
Sanyam Lakhanpal (Master Student at ASU). *Oct 2023 - Present*
Shrinidhi Kumbhar (Master Student at ASU). *Jan 2023 - Present*
Srija Macherla (SWE at Amazon). *Jan 2022 - Jun 2022*
Yankai Zeng (Ph.D student at The University of Texas at Dallas). *Aug 2020 - June 2021*

NLP Course Project Mentor
Domain Oriented Question Generation, 26 students, *Aug 2021 - Dec 2021*
Differential Diagnosis Dialogue Generation, 20 students, *Aug 2021 - Dec 2021*
Semantic Information Availability (SIA) Task, 5 students, *Jun 2020 - May 2020*
Question Answering with Varied Types of Reasoning, 5 students. *Jun 2020 - May 2020*

Teaching Assistant
CSE259 Logic in Computer Science *Dec 2020 - Dec 2021*
CSE579 Knowledge Representation and Reasoning *Aug 2019 - Dec 2019*

ACADEMIC SERVICE

Guest Editor, PLOS Digital Medicine.
Organizer, O-DRUM: Workshop on Open-Domain Reasoning under Multi-Modal Settings CVPR 2023.
Organizer, O-DRUM: Workshop on Open-Domain Retrieval under Multi-Modal Settings CVPR 2022.
Reviewers, ACL, NAACL, EMNLP, EACL, AAAI, NIPS, IROS.

AWARD

Finalist of 2021 Knowledge Mobilization Awards. Website *April 2021*
2019 ICLP conference Doctoral Consortium Travel Award. Website *September 2019*
Honorable Mention in Interdisciplinary Contest in Modeling(ICM) *April 2017*

INVITED TALK

"Advancing Multimodal Retrieval and Generation" at UMBC *Dev 2023*
"The Trend of Transformer-based Multimodal in Radiology" at RSNA *Nov 2023*
"Visual-Retriever-Reader for Knowledge-based Question Answering" at SERUM WACV *Jan 2023*
"Semantic Searching in Biomedical Domain" at exploreCSR workshop (ASU). *Mar 2021*

PUBLICATION

- **Luo, M.**, Xu, X., Dai, Z., Pasupat, P., Kazemi, M., Baral, C., ... Zhao, V. Y. Dr. ICL: Demonstration-Retrieved In-context Learning. NeurIPS 2023 Workshop R0-FoMo.
- **Luo, M.**, Tariq, A., Patel, B.,Banerjee, I. M3-X: Multimodal Generative Model for Screening Mammogram Reading and Explanation Medical Imaging Meets NeurIPS 2023.
- Varshney, N., **Luo, M.**, Baral, C. Exploring Training Objectives for Passage-level Differentiable Search Indexing SocalNLP 2023.
- **Luo, M.**, Tariq, A., Patel, B.,Banerjee, I. Transformer-based Multimodal Generative Model: Use-case of Screening Mammogram Reading. RSNA 2023.
- **Luo, M.** Fang, Z. Gokhale, T. Baral, C. End-to-end Knowledge Retrieval with Multi-modal Queries. ACL 2023.
- **Luo, M.**, Jain, S., Gupta, A., Einolghozati, A., Oguz, B., Chatterjee, D., Chen, X., Baral, C. and Heidari, P., 2022. A Study on the Efficiency and Generalization of Light Hybrid Retrievers. ACL 2023.
- Parmar, M., Mishra, S., Purohit, M., **Luo, M.**, Baral, C. In-BoXBART: Get Instructions into Biomedical Multi-Task Learning. NAACL 2022 Findings.
- Gokhale, T., Mishra, S., **Luo, M.**, Sachdeva, B., Baral, C. Generalized but not Robust? Comparing the Effects of Data Modification Methods on Out-of-Domain Generalization and Adversarial Robustness. ACL 2022 Findings.
- **Luo, M.**, Mitra, A., Gokhale, T., Baral, C. Improving Biomedical Information Retrieval with Neural Retrievers. AAAI 2022.
- **Luo, M.**, Zeng, Y., Banerjee, P., Baral, C. Weakly-Supervised Visual-Retriever-Reader for Knowledge-based Question Answering. EMNLP 2021.
- **Luo, M.** Sampat, S. Tallamn, R. Zeng, Y. Vancha, M. Sajja, A. Baral, C. Just because you are right, doesnt mean I am wrong: Overcoming a bottleneck in development and evaluation of Open-Ended VQA tasks. EACL 2021.
- Lee, J. and **Luo, M.**, 2019. Strong equivalence for LPMLN programs. ICLP 2019.
- Varshney, N., **Luo, M.**, Baral, C. Can Open-Domain QA Reader Utilize External Knowledge Efficiently like Humans? AAAI 2023 Workshop on Knowledge Augmented Methods for NLP

- **Luo, M.**, Parmar, M., Mahendran, J. S., Jain, S., Rawal, S., Baral, C. SCONER: Scoring Negative Candidates Before Training Neural Re-Ranker For Question Answering ICML 2022 Workshop on Knowledge Retrieval and Language Models.
- **Luo, M.**, Saxena, S., Mishra, S., Parmar, M., Baral, C. BioTABQA: Instruction Learning for Biomedical Table Question Answering CEUR Workshop 2022.
- **Luo, M.** Neural Retriever and Go Beyond: A Thesis Proposal. NAACL 2022 Student Research Workshop.
- **Luo, M.**, Chen, S., Baral, C A Simple Approach to Jointly Rank Passages and Select Relevant Sentences in the OBQA Context NAACL 2022 Student Research Workshop.
- **Luo, M.**, Hashimoto, K., Yavuz, S., Liu, Z., Baral, C., Zhou, Y. Choose Your QA Model Wisely: A Systematic Study of Generative and Extractive Readers for Question Answering ACL 2022 Spa-NLP workshop.

PRE-PRINT

- Chiang, C. C., **Luo, M.**, Dumkrieger, G., Trivedi, S., Chen, Y. C., Chao, C. J., ... & Banerjee, I. A Large Language Model-Based Generative Natural Language Processing Framework Finetuned on Clinical Notes Accurately Extracts Headache Frequency from Electronic Health Records medRxiv preprint 2023.
- **Luo, M.**, Kumbhar, S., Parmar, M., Varshney, N., Banerjee, P., Aditya, S., Baral, C. Towards LogiGLUE: A Brief Survey and A Benchmark for Analyzing Logical Reasoning Capabilities of Language Models. arXiv preprint 2023.
- Macherla, S., **Luo, M.**, Parmar, M., Baral, C. MDDial: A Multi-turn Differential Diagnosis Dialogue Dataset with Reliability Evaluation. arXiv preprint 2023.
- **Luo, M.**. Neural Retriever-Reader for Information Retrieval and Question Answering (Doctoral dissertation, Arizona State University, 2023).
- Varshney, N., Parmar, M., Patel, N., Handa, D., Sarkar, S., **Luo, M.**, Baral, C.. Can NLP Models Correctly Reason Over Contexts that Break the Common Assumptions?. arXiv preprint 2023.
- Liu, Z., Chen, Y., Li, J., **Luo, M.**, Yu, P. S., Xiong, C. Improving contrastive learning with model augmentation. arXiv preprint 2022.
- Banerjee, P., Baral, C., **Luo, M.**, Mitra, A., Pal, K., Son, T. C., Varshney, N. Can Transformers Reason About Effects of Actions? arXiv preprint, 2020.

BOOK MANUSCRIPT

Advances in Multi-Modal Information Retrieval (In Preparation) *Springer*