Amin Bigdeli

Personal Data

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Education

Present Spring 2023	PhD Student in Computer Science University of Waterloo, Waterloo, Canada Supervisor: Dr. Charles L. A. Clarke and Dr. Ebrahim Bagheri Related courses: Advanced Topics in HCI: 4/4, Advanced Topics in Databases: 4/4
Fall 2021 Fall 2020	Master of Science in Information Technology Management Toronto Metropolitan University, Toronto, Canada Supervisors: Dr. Ebrahim Bagheri and Dr. Morteza Zihayat Thesis: "Exploration and Mitigation of Stereotypical Gender Biases in Information Retrieval Systems" Related courses: Deep Learning for NLP: 4/4, Graph Neural Networks: 4/4, Graph Mining: 4/4
Fall 2019 Fall 2015	Bachelor of Science in Computer Engineering Ferdowsi University of Mashhad, Mashhad, Iran Related courses: Information Retrieval: 4/4, Data Mining: 4/4, Artificial Intelligence and Expert Systems: 4/4 Advanced Programming: 4/4, Software Engineering: 4/4, Computer Networks: 4/4

Research Interests

Information retrieval	Responsible AI	Recommender Systems
Natural Language Processing	Semantic Search	Machine Learning

Skills

Programming	Python, Java, C/C++, Assembly
Libraries	Transformers, Pytorch, Tensorflow, Pandas, Gensim, NLTK, Fasttext, Scikit-Learn, Lucene
Tools	Latex, Git, MySQL, Keil, Proteus

Work Experience

May 2023 - Present	Research Assistant - University of Waterloo, Waterloo Conducting research on Semantic search and Dense Passage retrieval.
Sep 2020 - Present	Research Assistant - Ryerson University, Toronto – Collaborating with industry partners to create intellectual property and facilitate technology transfer, seamlessly incorporating this intellectual property into the industry partners' tool suite to deliver solutions to large number of customers. – Conducting research in the field of information retrieval and publishing research papers in scholarly conferences and journals.

Invited Talks

October 2021. Stereotypical Biases in Information Retrieval Systems. Invited talk at Microsoft Research.
December 2021. De-biasing Methods for Mitigating Gender Biases in Information Retrieval Systems. Invited talk at Information Retrieval group of Radboud University.

Journal Articles

1. Soorosh, S. Roohollah, E. **Bigdeli, A.** Zihayat, M. and Bagheri, E. "Feature-based Question Routing in Community Question Answering Platforms". In Information Sciences Journal (INS 2022).

CONFERENCE PAPERS

1. **Bigdeli, A.** Arabzadeh, N. Bagheri, E. and Clarke, C. "EMPRA: Embedding Perturbation Rank Attack against Neural Ranking Models". Under Review for a Suitable Conference.

2. **Bigdeli, A.** Arabzadeh, N. Bagheri, E. and Clarke, C. "Leveraging Large Language Models for Adversarial Attacks on Information Retrieval Systems". Under Review for a Suitable Conference.

3. **Bigdeli, A.** Arabzadeh, N. Bagheri, E. and Clarke, C. "Evaluating Relative Retrieval Effectiveness with Normalized Residual Gain". Under Review for a Suitable Conference.

4. **Bigdeli, A.** Arabzadeh, N. Khodabakhsh, M. Salamat, S. Seyedsalehi, S and Bagheri, E. "Estimating Query Performance based on Nearest Neighbor Sampling". Under Review for a Suitable Conference.

5. **Bigdeli, A.** Arabzadeh, N. and Bagheri, E. "Learning to Jointly Transform and Rank Difficult Queries". In 46th European Conference on IR Research (**ECIR 2024**).

6. Arabzadeh, N. **Bigdeli, A.** and Clarke, C. "Adapting Standard Retrieval Benchmarks to Evaluate Generated Answers". In 46th European Conference on IR Research (**ECIR 2024**).

7. Arabzadeh, N. **Bigdeli, A.** and Bagheri, E. "LaQuE: Enabling Entity Search at Scale". In 46th European Conference on IR Research (**ECIR 2024**).

8. **Bigdeli, A.** Arabzadeh, N. Seyedsalehi, S. Zihayat, M. and Bagheri, E. "De-biasing Relevance Judgements for Fair Ranking." In 45th European Conference on IR Research (**ECIR 2023**).

9. Arabzadeh, N. **Bigdeli, A.** Hamidi Rad, R. and Bagheri, E. "Quantifying Ranker Coverage of Different Query Subspaces." In 46th European Conference on IR Research (**SIGIR 2023**).

10. Salamat, S. Arabzadeh, N. Seyedsalehi, S. **Bigdeli, A.** Zihayat, M. and Bagheri, E. "Neural Disentanglement of Query Difficulty and Semantics." In 32nd ACM International Conference on Information and Knowledge Management (**CIKM 2023**).

11. Salamat, S. Arabzadeh, N. **Bigdeli, A.** Seyedsalehi, S. Zihayat, M. and Bagheri, E. "Don't Raise Your Voice, Improve Your Argument: Learning to Retrieve Convincing Arguments". In 45th European Conference on IR Research (**ECIR 2023**).

12. Seyedsalehi, S. **Bigdeli, A.** Arabzadeh, N. Zihayat, M. and Bagheri, E. "Addressing Gender-related Performance Disparities in Neural Rankers". In 45th International ACM SIGIR Conference on Research and Development in Information Retrieval (**SIGIR 2022**).

13. **Bigdeli, A.** Arabzadeh, N. Seyedsalehi, S. Zihayat, M. and Bagheri, E. "A Light-weight Strategy for Restraining Gender Biases in Neural Rankers". In 44th European Conference on IR Research (**ECIR 2022**). **[Best Paper Award]**

14. Seyedsalehi, S. **Bigdeli, A.** Arabzadeh, N. Mitra, B. Zihayat, M. and Bagheri, E. "Bias-aware Fair Neural Ranking for Addressing Stereotypical Gender Biases". In 25th International Conference on Extending Database Technology (**EDBT 2022**).

15. **Bigdeli, A.** "Exploration and Mitigation of Stereotypical Gender Biases in Information Retrieval Systems". In 35th Canadian Artificial Intelligence Association (**CAIAC 2022**). **[Best Master's Thesis Award]**

16. **Bigdeli, A.** Arabzadeh, N. Seyedsalehi, S. Zihayat, M. and Bagheri, E. "On the Orthogonality of Bias and Effectiveness in Ad hoc Retrieval". In 44th International ACM SIGIR Conference on Research and Development in Information Retrieval (**SIGIR 2021**).

17. Arabzadeh, N. **Bigdeli, A.** Seyedsalehi, S. Zihayat, M. and Bagheri, E. "Matches Made in Heaven: Toolkit and Large-Scale Datasets for Supervised Query Reformulation". In 30th ACM International Conference on Information and Knowledge Management (**CIKM 2021**).

18. **Bigdeli, A.** Arabzadeh, N. Zihayat, M. and Bagheri, E. "Exploring Gender Biases in Information Retrieval Relevance Judgement Datasets". In 43rd European Conference on IR Research (**ECIR 2021**).

19. Arabzadeh, N. **Bigdeli, A.** Zihayat, M. and Bagheri, E. "Query Performance Prediction through Retrieval Coherency". In 43rd European Conference on IR Research (**ECIR 2021**).

20. Bashari, B. Ameli, A. **Bigdeli, A.** and Behkamal, B. "Analyzing co-authorship patterns using frequent patterns extraction case study: Ferdowsi University of Mashhad". In 5th International Conference on Web Research (**ICWR 2019**).

Tutorials

1. **Bigdeli, A.** Arabzadeh, N. Seyedsalehi, S. Zihayat, M. and Bagheri, E. "Understanding and Mitigating Gender Bias in Information Retrieval Systems." In 45th European Conference on IR Research (ECIR 2023).

2. **Bigdeli, A.** Arabzadeh, N. Seyedsalehi, S. Zihayat, M. and Bagheri, E. "Gender Fairness in Information Retrieval Systems". In 45th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR 2022).

Awards and honors

2024	Alberta Machine Intelligence Institute (Amii) AI Week Talent Bursary
2023	Invited to author a book for Foundations and Trends in Information Retrieval (FNTIR) on Gender bias in Information Retrieval (In Progress)
2023	University of Waterloo Entrance Scholarship
2023	Alberta Machine Intelligence Institute (Amii) AI Week Talent Bursary
2022	Best Paper Award at 44th European Conference on Information Retrieval (ECIR 2022)
2022	Best Master's Thesis Award at 35th Canadian Artificial Intelligence Association (CAIAC 2022)
2022	Alberta Machine Intelligence Institute (Amii) AI Week Talent Bursary
2020	Ryerson Graduate Fellowship

Peer Reviewing Experience

- International World Wide Web Conference, WWW
- International ACM SIGIR Conference on Research and Development in Information Retrieval, SIGIR
- ACM International Conference on Information and Knowledge Management, CIKM
- European Conference on Information Retrieval, ECIR
- Centre for Advanced Studies Conference, CASCON
- Canadian Conference on Electrical and Computer Engineering, CCECE

Teaching Assistant

2022	Systems Analysis and Design (ITM305), Ryerson University
2021	Big Data Analytics (ITM760), Ryerson University
2021	Artificial Intelligence in Business (ITM703), Ryerson University
2020	Object Oriented Design Patterns, Ferdowsi University of Mashhad
2019	Software Engineering, Ferdowsi University of Mashhad
2019	Microprocessor and Assembly Language, Ferdowsi University of Mashhad
2019	Design and Implementation of Programming Languages, Ferdowsi University of Mashhad
2019	ARM Microcontroller Programming, Ferdowsi University of Mashhad
2018	Database Design, Ferdowsi University of Mashhad

References

Dr. Charles Clarke
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Dr. Ebrahim Bagheri
Full Professor at Toronto Metropolitan University
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Dr. Morteza Zihayat
Associate Professor at Toronto Metropolitan University
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