Rashidul Islam

Curriculum Vitae

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Education

2018–2022 **Doctor of Philosophy**, *Department of Information Systems, University of Maryland, Baltimore County (UMBC), USA. CGPA 3.82/4.00.*

2018–2020 **Master of Science**, *Department of Information Systems, University of Maryland, Baltimore County (UMBC), USA. CGPA 3.82/4.00.*

2013-2014 **Master of Science**, *Department of Electrical & Electronics Engineering, University of Dhaka (DU), Bangladesh. CGPA 3.66/4.00.*

2009-2012 **Bachelor of Science**, *Department of Applied Physics, Electronics & Communication Engineering, University of Dhaka (DU), Bangladesh. CGPA 3.48/4.00.*

Research Interests

My research interests lie in developing socially responsible machine learning methods to address fairness and ethical concerns in AI systems. I aim to model, measure, and correct implicit bias, emphasizing fair learning algorithms without relying on protected demographic features. My recent work also explores post-processing fairness techniques for black box models, mitigating societal biases in deployed systems while addressing the challenges of expensive retraining of large models and limited access to model parameters.

Work Experience

Aug'22 - Present **Staff Research Scientist**, Visa Research, Visa USA Inc., Atlanta, GA
- Developed AI fairness solutions to address privacy concerns on demographic data use
- Created model-agnostic post-processing fairness method for deployed black-box systems
- Building a fairness framework for Visa, applicable in scenarios with limited demographics
- Designed a financial foundation model for the payment industry using transformers.

Jan'18 - Jul'22 **Research Assistant**, Information Systems Department, UMBC, Baltimore, MD
- Developed deployment-ready fair AI technologies by removing practical barriers
- Designed stochastic learning algorithms and Bayesian modeling for intersectional fairness
- Mitigated demographic biases in social media-based career recommendation systems
- Created a sparse stochastic collapsed inference algorithm to scale up topic models.

May'19 - Aug'19 **Wavelet Development Intern**, The MathWorks Inc., Natick, MA
- Investigated proof of concepts for Gabor scattering transforms, mixed filters, pooling, and non-linearities to enhance feature extraction in ML workflows.

Aug'16 - Dec'17 **Graduate Assistant**, CSEE Department, UMBC, Baltimore, MD
- Conducted lab discussion sessions, and proctored exams for undergraduate courses
- Developed a low-power embedded system for artifact detection in brain signals
- Designed an FPGA-based scalable accelerator for high-throughput MCMC algorithms.

Dec'14 - Jul'16 **Core Network Engineer**, Huawei Technologies Ltd., Bangladesh
- Operated and managed core network systems operations, including troubleshooting, maintenance, and equipment upgrades to enhance product services.

Research and Technical Skills

Research:	AI Fairness and Ethics, Deep Learning, Natural Language Processing
Programming Languages:	Python, PyTorch, Hugging Face, Keras, Pyro, PyMC3, Gensim, Scikit-learn MATLAB, GNU Octave, Julia, R
Big Data:	Hadoop, Hive, PySpark, SQL, Scala.

Publications

For more recent publications, please see my Google Scholar.

Peer-Reviewed Conference Papers

- **R. Islam**, H. Chen, and Y. Cai. Fairness without Demographics through Shared Latent Space-Based Debiasing. *AAAI Conference on Artificial Intelligence (AAAI)*. Vol. 38. No. 11. 2024.***(Acceptance rate 23.75%)***
- **R. Islam**, S. Pan, and J.R. Foulds. Fair Inference for Discrete Latent Variable Models: An Intersectional Approach. *ACM International Conference on Information Technology for Social Good (GoodIT)*, 2024. ***(Acceptance rate 34.15%)***
- Y. Zhao, M. Xu, H. Chen, Y. Chen, Y. Cai, **R. Islam**, Y. Wang, T. Derr. Can One Embedding Fit All? A Multi-Interest Learning Paradigm Towards Improving User Interest Diversity Fairness. *The ACM on Web Conference (WWW)*, 2024. ***(Acceptance rate 20.2%)***
- S. Wang, X. Yang, R. Islam, H. Chen, M. Xu, J. Li, and Y. Cai. Enhancing Distribution and Label Consistency for Graph Out-of-Distribution Generalization. *IEEE International Conference on Data Mining (ICDM)*, 2024. ***(Acceptance rate 19.5%)***
- Z. Wu, Y. Cai, **R. Islam**. Rethinking Fairness in LLM Tabular Tasks: A Mixture of LoRA Experts Approach. *Under submission*, 2024.
- C. Wang, K. Wang, A. Bian, **R. Islam**, K. Keya, J. R. Foulds and S. Pan. Do Humans Prefer Debiased AI Algorithms? A Case Study in Career Recommendation. *ACM International Conference on Intelligent User Interfaces (IUI)*, 2022. ***(Acceptance rate 24.5%)***
- **R. Islam**, K. Keya, Z. Zeng, S. Pan, and J. R. Foulds. Debiasing Career Recommendations with Neural Fair Collaborative Filtering. *The ACM on Web Conference (WWW)*, 2021. ***(Acceptance rate 20.6%)***
- **R. Islam**, S. Pan, and J.R. Foulds. Can We Obtain Fairness for Free? *AAAI/ACM Conference on Artificial Intelligence, Ethics and Society (AIES)*, 2021. ***(Acceptance rate 37.3%)***
- K. Keya, **R. Islam**, S. Pan, I. Stockwell and J. Foulds. Equitable Allocation of Healthcare Resources with Fair Survival Models. *SIAM International Conference on Data Mining (SDM)*, 2021. ***(Acceptance rate 21.25%)***

- Z. Zeng, **R. Islam**, K. Keya, J. Foulds, Y. Song, and S. Pan. Fair Heterogeneous Network Embeddings. In *International AAAI Conference on Web and Social Media (ICWSM)*, 2021. ***(Acceptance rate 20%)***
- J. R. Foulds, **R. Islam**, K. Keya, and S. Pan. An Intersectional Definition of Fairness. *IEEE International Conference on Data Engineering (ICDE)*, 2020. ***(Acceptance rate 18%)***
- J. R. Foulds, **R. Islam**, K. Keya, S. Pan. Bayesian Modeling of Intersectional Fairness: The Variance of Bias. *SIAM International Conference on Data Mining (SDM)*, 2020. ***(Acceptance rate 24%)***
- **R. Islam** and J. R. Foulds. Scalable Collapsed Inference for High-dimensional Topic Models. *Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL)*, 2019. ***(Acceptance rate 26.3%)***
- M. Hosseini,**R. Islam**, L. Marni, and T. Mohsenin. MPT: Multiple Parallel Tempering for High-throughput MCMC Samplers. *IEEE International System-on-Chip Conference (SOCC) (pp. 244-249)*, 2018.
- **R. Islam**, W. D. Hairston, T. Oates and T. Mohsenin. An Online EEG Artifact Detection and Removal System for Embedded Processors. *IEEE Signal Processing in Medicine and Biology Symposium (SPMB)*, 2017.
- M. Hosseini, **R. Islam**, A. Kulkarni and T. Mohsenin. A Scalable FPGA-based Accelerator for High-throughput MCMC Algorithms. In *IEEE Symposium on Field-Programmable Custom Computing Machines (FCCM)*, 2017.

Peer-Reviewed Journal Papers

- **R. Islam**, K.N. Keya, S. Pan, A.D. Sarwate, and J.R. Foulds. Differential Fairness: An Intersectional Framework for Fair AI. *Entropy*, 25(4):660, 2023.
- C. Wang, K. Wang, A. Y. Bian, **R. Islam**, K. N. Keya, J. R. Foulds, and S. Pan. When Biased Humans Meet Debiased AI: A Case Study in College Major Recommendation. *ACM Transactions on Interactive Intelligent Systems (TIIS)*, 13(3):17, 2023.

Peer-Reviewed Workshop and Symposium Papers

- K. Keya, **R. Islam**, S. Pan, I. Stockwell and J. R. Foulds. Equitable Allocation of Healthcare Resources with Fair Cox Models. *AAAI Fall Symposium on AI in Government and Public Sector (AAAI FSS)*, 2020.
- C. Wang, K. Wang, A. Bian, **R. Islam**, K. Keya, J. R. Foulds and S. Pan. An User study on a De-biased Career Recommender System. *Mid-Atlantic Student Colloquium on Speech, Language and Learning (MASC-SLL)*, 2020.
- **R. Islam**, K. Keya, S. Pan, and J. R. Foulds. Mitigating Demographic Biases in Social Media-based Recommender Systems. *The 25th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD) Social Impact Track (extended abstract)*, 2019.
- J. R. Foulds, **R. Islam**, K. Keya, and S. Pan. Differential Fairness. *NeurIPS 2019 Workshop on Machine Learning with Guarantees*, 2019.
- **R. Islam** and J. R. Foulds. Towards a Highly Efficient Online Inference Algorithm for Latent Dirichlet Allocation. In *Mid-Atlantic Student Colloquium on Speech, Language and Learning (MASC-SLL)*, 2018.

Thesis

- **R. Islam**. Intersectional Fairness in Machine Learning: Measurements, Algorithms, and Applications. PhD Thesis. University of Maryland, Baltimore County (UMBC), 2022.

Academic Services

Reviewer AAAI 2024, NeurIPS 2022, NeurIPS 2021, ICML 2020, ICTAI 2020.

Honors and Awards

- IS Department Student Research Symposium Awards 2022, UMBC: *Overall winner, PhD Student Research Award* (completed dissertation proposal category)
- IS Department Graduate Student Poster Day Awards 2021, UMBC: *Overall winner, PhD Student Research Award* (completed dissertation proposal category)
- IS Department Graduate Student Poster Day Awards 2021, UMBC: *1st place, Poster Competition* (completed research category)
- *Student Scholarship Award* from The Web Conference (WWW), 2021
- *GSA Professional Development* and *IS Department Grant* to attend in NAACL, 2019
- *NST Fellowship for M.S. Thesis* from Ministry of Science & Technology, Bangladesh, 2014.