

# Muhammad Ali



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## Education

2018 – 2023 **Ph.D., Northeastern University**

Boston, MA Computer Science; Advisor: Alan Mislove

Thesis: *Measuring the Harms of Personalization through Advertising*

**Outstanding Graduate Student in Research Award**

Selected Coursework: machine learning, parallel data processing, distributed systems

2016 – 2018 **M.Sc., Saarland University**

Saarbrücken, Germany Computer Science

Selected Coursework: information retrieval, data mining and matrices, social network analysis, natural language processing, probabilistic graphical models

2011 – 2015 **B.S., National University of Computer & Emerging Sciences**

Lahore, Pakistan Computer Science

## Experience

Oct 2023 – Present **Postdoctoral Researcher**

Boston, MA **Institute for Experiential AI, Northeastern University**

Part of the Responsible AI team, conducting research on measuring and mitigating fairness issues in machine learning systems.

Sep 2018 – Oct 2023 **Graduate Research Assistant**

Boston, MA **Khoury College of Computer Sciences, Northeastern University**

Conducting large-scale measurement studies of discrimination and harm in public-facing machine learning systems, with a focus on modern advertising platforms. Published work at CSCW 2019, WSDM 2021, and others.

May 2022 – Aug 2022 **Research Intern, Machine Learning**

Burlington, MA **Oracle Labs**

Worked with the Machine Learning Research Group on measuring linguistic biases in large language models (e.g. BERT), both in the embedding-space and in downstream tasks. Advised by Swetasudha Panda, Qinlan Shen, and Michael Wick.

Aug 2021 – Nov 2021 **Research Intern, Ethical AI**

Hillsboro, OR **Intel Corporation**

Worked with the AI and Analytics team to build automated model cards and explainability notebooks (with SHAP) for Intel AI's open source model repository.

Jun 2017 – Aug 2018 **Research Assistant**

Saarbrücken, Germany **Max Planck Institute for Software Systems**

Research projects in algorithm auditing, using web data for demography and measuring urban segregation. Advised by Krishna Gummadi, published work at FAccT 2018.

Aug 2015 – Mar 2016 **Backend Engineer**

Lahore, Pakistan **Patari Music**

Built the foundation for the music platform's social features with a graph database; maintained and added new features to the backend API.

## Skills

Technical	<i>Active Use:</i> Python (jupyter, matplotlib, pytorch, pandas, numpy, huggingface etc.), R, JavaScript, SQL, Unix, L <sup>A</sup> T <sub>E</sub> X; <i>Past Use:</i> MATLAB, C, C++, Go, Scala, Spark, Hadoop, Node.js, PHP, React
Research	algorithm auditing, explainable/responsible AI, data analysis (exploratory, descriptive), data visualization, writing, dataset collection, applied machine learning, large scale measurements, computational social science

## Publications [Google Scholar]

USENIX Security '23	<b>Problematic Advertising and its Disparate Exposure on Facebook</b> Muhammad Ali, Angelica Goetzen, Alan Mislove, Elissa Redmiles, Piotr Sapiezynski USENIX Security Symposium, Anaheim, CA. Aug 2023
ConPro '22	<b>All Things Unequal: Measuring Disparity of Potentially Harmful Ads on Facebook</b> Muhammad Ali, Angelica Goetzen, Alan Mislove, Elissa Redmiles, Piotr Sapiezynski ConPro at IEEE S&P. San Francisco, CA. May 2022
WSDM '21	<b>Ad Delivery Algorithms: The Hidden Arbiters of Political Messaging</b> Muhammad Ali*, Piotr Sapiezynski*, Aleksandra Korolova, Alan Mislove, Aaron Rieke WSDM, Online. Mar 2021
CSCW '19	<b>Discrimination through Optimization: How Facebook's ad delivery can lead to skewed outcomes</b> Muhammad Ali*, Piotr Sapiezynski*, Miranda Bogen, Aleksandra Korolova, Alan Mislove, Aaron Rieke CSCW, Austin, TX. Nov 2019 <b>Diversity &amp; Inclusion Award, Honorable Mention</b>
FAccT '18	<b>Potential for Discrimination in Online Targeted Advertising</b> Till Speicher, Muhammad Ali, Giridhari Venkatadri, Filipe Ribeiro, George Arvanitakis, Fabricio Benevenuto, Krishna Gummadi, Patrick Loiseau, Alan Mislove FAccT, New York, NY. Feb 2018 <b>Best Paper Nominee</b>
FAccTRec '17	<b>On Quantifying Knowledge Segregation in Society</b> Abhijnan Chakraborty, Muhammad Ali, Saptarshi Ghosh, Niloy Ganguly, Krishna Gummadi FAccTRec at ACM RecSys, Como, Italy. Aug 2017 <small>* equal contribution</small>

## Teaching

Summer 2023	<b>Instructor</b> <b>Northeastern University</b> CY 2550: Foundations of Cybersecurity
Fall 2022	<b>Teaching Assistant</b> <b>Northeastern University</b> CS 6140: Machine Learning, with Predrag Radjovac

## Service

Program Committee	WWW 2023; FAccT 2021 — 2023; IC2S2 2023; SoLaR @ NeurIPS 2023
External Reviewer	CSCW 2020, 2021, 2023; PETS 2022; NeurIPS 2021, 2023 (ethics reviewer)
Other	Northeastern PhD Admissions Committee, Fall 2021