

Avijit Ghosh

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Algorithmic Fairness Ethical AI Machine Learning AI Explainability Computational Social Science

Education

Northeastern University <i>Ph.D. candidate in Computer Science (Advised by Dr. Christo Wilson)</i>	Boston, MA 2019 - 2023 (Expected)
Indian Institute of Technology (IIT) Kharagpur <i>B.Tech. in Chemical Engineering, M.Tech in Financial Engineering, Minor in Computer Science</i>	Kharagpur, India 2014 - 2019

Experience

Twitter <i>Research Intern</i>	San Francisco, CA Sep - Dec 2021 and Jun - Aug 2022
<ul style="list-style-type: none">Worked with the META (Machine Ethics, Transparency and Accountability) team at Twitter, to investigate the relationship between demography agnostic and demography dependent author impression fairness metrics at scale.Developed home timeline diversity metrics based on user feedback, to find balance between recommendation efficiency and fairness.	
Fiddler Labs <i>Research Intern</i>	Palo Alto, CA Oct 2020 - Apr 2021
<ul style="list-style-type: none">Explain distributional shifts in Machine Learning model outputs by unifying Shapley based methods.Using optimal transport theory, proposed a threshold independent fairness metric that allows for real time explanations.Worked with the product team and civil rights lawyers in the deployment of Fiddler's Machine Learning model fairness dashboard. Introduced and incorporated intersectional fairness metrics in the product.	
Northeastern University <i>Research Assistant at Khoury College of Computer Sciences Advisors: Alan Mislove, Christo Wilson</i>	Boston, MA Sep. 2019 - Present
<ul style="list-style-type: none">Analyzing Fair ranking systems and showing how they fail in the presence of noisy protected attribute data. Also investigated adversarial attacks on the guaranteed fairness of retrieval systems.A cooperative fairness audit of the recommendation algorithm of PyMetrics, a talent matching software. Press Release, Wired, MIT Tech Review, The AP.Investigated Facebook's Special Audiences system for opportunity advertisements and showed that the audience creation algorithm was still biased against women, seniors and minorities. Covered in the media by Propublica, The Federal Reserve and Mother Jones.Analyzed the ad reach and spend information obtained from Facebook's ad transparency feature and the personal targeting dataset from Propublica's Facebook ad dataset and showed that advertisers with higher budgets use more privacy sensitive targeting techniques like PII or Lookalike audiences. Findings published and presented at IEEE ConPro 2019.	
LIG, University of Grenoble Alps <i>Visiting Researcher Advisor: Oana Goga</i>	Grenoble, France May 2019 - July 2019
<ul style="list-style-type: none">Study of how news companies promote different items on social media, investigating possible patterns of differential information spreading using both posts and ads.We also discovered and reported an exposed access token bug to Facebook Bug Bounty.	
Xerox Research Centre <i>Research Intern</i>	Bangalore, India May 2017 - July 2017
<ul style="list-style-type: none">Implemented XTrack, a Smart Vehicle Tracking and Battery usage minimizing Algorithm, using BLE to relay GPS information.Proposed a method for Uber-like Surge Price Prediction using Spatio-Temporal techniques like the Neural Hawkes and Recurrent Marked Temporal Point Process. Awarded the title of Best Internship Project.	
Google Summer of Code <i>GSoC Student at OpenMRS</i>	Remote Apr 2016 - Aug 2016
<ul style="list-style-type: none">Replaced the HTML XForms system used with native generated forms using the Forms REST Api in the android client of the Opensource Medical Record System. Added offline form saving. Configured Travis CI to automatically build and push the apk to the play store.Overall, contributed 100K lines of code and became the top code contributor in the project repository.	
IIT Kharagpur <i>Undergraduate Researcher Advisors: Niloy Ganguly, Saptarshi Ghosh - CNERG Lab</i>	Kharagpur, India 2014 - 2019
<ul style="list-style-type: none">Automated Extraction of Catchwords from Legal Documents using a novel NER tagger to help categorize lengthy legal texts.Automatically position user comments against relevant news article paragraphs. Presented at ECIR 2019.Savitr - A real-time location extraction system for disaster management using twitter. Presented at WWW-SMERP 2018.Classification and Summarization of tweets during a disaster event, presented at IBM Day 2016.	

Select Publications

Peer-Reviewed

Can There be Art Without an Artist? <i>Avijit Ghosh, Genoveva Fossas</i>	HEGM@NeurIPS '22 New Orleans, USA
Subverting Fair Image Search with Generative Adversarial Perturbations <i>Avijit Ghosh, Matthew Jagielski, Christo Wilson</i>	FACCT '22 Seoul, South Korea
FairCanary: Rapid Continuous Explainable Fairness <i>Avijit Ghosh*, Aalok Shanbhag*, Christo Wilson</i>	AIES '22 Oxford, United Kingdom
Algorithms that “Don’t See Color”: Comparing Biases in Lookalike and Special Ad Audiences <i>Piotr Sapiezynski, Avijit Ghosh, Levi Kaplan, Alan Mislove, Aaron Rieke</i>	AIES '22 Oxford, United Kingdom
When Fair Ranking Meets Uncertain Inference <i>Avijit Ghosh, Ritam Dutt, Christo Wilson</i>	SIGIR '21 Montreal, Canada / Virtual
Building and Auditing Fair Algorithms: A Case Study in Candidate Screening <i>Christo Wilson, Avijit Ghosh, Shan Jiang, Alan Mislove, Lewis Baker, Janelle Szary, Kelly Trindel, Frida Polli</i>	FACCT '21 Toronto, Canada / Virtual
Characterizing Intersectional Group Fairness with Worst-Case Comparisons <i>Avijit Ghosh, Lea Genuit, Mary Reagan</i>	AIDBEI@AAAI '21 Vancouver, Canada / Virtual
Analyzing Political Advertisers’ Use of Facebook’s Targeting Features <i>Avijit Ghosh, Giridhari Venkatadri, Alan Mislove</i>	Conpro@S&P '19 San Francisco, USA
Public Sphere 2.0: Targeted Commenting in Online News Media <i>Ankan Mullick, Sayan Ghosh*, Ritam Dutt*, Avijit Ghosh*, Abhijnan Chakrabarty</i>	ECIR '19 Cologne, Germany
SAVITR: A System for Real-time Location Extraction from Microblogs during Emergencies <i>Ritam Dutt, Kaustubh Hiware, Avijit Ghosh, Rameshwar Bhaskaran</i>	SMERP@WWW '18 Lyon, France

Preprints

Unified Shapley Framework to Explain Prediction Drift <i>Aalok Shanbhag*, Avijit Ghosh*, Josh Rubin*</i>	Under Review
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Miscellaneous

Connectedness of Markets with Heterogeneous Agents and the Information Cascades <i>Avijit Ghosh, Aditya Chourasiya, Lakshay Bansal, Abhijeet Chandra</i>	App. Adv. Analytics'21 Journal
WebSelect: A Research Prototype for Optimizing Ad Exposures based on Network Structure <i>Avijit Ghosh, Agam Gupta, Divya Sharma, Uttam Sarkar</i>	WITS'19 Dublin, Ireland

* Equal contribution

Awards and Grants

2022	Winner , Best Paper - Runner Up	Conpro'22
2019	Winner , Best Poster Award	ECIR'19
2019	Dean's Fellowship , First Year PhD students	Northeastern University
2019	Winner , Institute Order of Merit - Technology	IIT Kharagpur
2018	Winner , SGSIS Institute Challenge Grant - Worth ₹1M	IIT Kharagpur
2017	Silver Medal , Stock Market Analysis	Inter IIT Tech Meet, Kanpur
2016	Gold Medal , Software Development	Inter IIT Tech Meet, Mandi
2012	Governor's Medal , National Rank 5, ICSE Board	Government of West Bengal
2010	NTSE Scholar , National Talent Search Examination	NCERT

Service and Leadership

Multiple	Invited Speaker	UKCDEI'22, Trustworthy ML Initiative'22, SXSW'23
Multiple	Program Committee/Reviewer	FACCT'22, AIES'22, NeurIPS'21,22, EMNLP'22, WWW'23
Multiple	Organizer - Queer in AI	SIGIR'21, FACCT'22
2016	Founder - Kharagpur Open Source Society	IIT Kharagpur

Technical Skills

Languages: Python, Java, C, R, Bash, SQL, HTML/CSS, JavaScript, Matlab
Tools & Frameworks: Git, TravisCI, Pytorch, Keras, TensorFlow, Docker, AWS, Sagemaker, Google Cloud ML, Android
Machine Learning: Transformers/BERT, ResNets, Adversarial examples, Fairness, Explainability