

# Avijit Ghosh

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Ethical AI | Fairness | Computational Social Science | Machine Learning | Information Retrieval | Natural Language Processing

## Education

### Northeastern University

Ph.D. student in Computer Science

### Indian Institute of Technology (IIT) Kharagpur

B.Tech. in Chemical Engineering, M.Tech in Financial Engineering, Minor in Computer Science

Boston, MA

2019 – Present

Kharagpur, India

2014 – 2019

## Experience

### Northeastern University

Research Assistant at Khoury College of Computer Sciences | Advisors: Alan Mislove, Christo Wilson

Boston, MA

Sep 2019 – Present

- Collaborating with **PyMetrics**, a talent matching software, to audit their end to end pipeline to discover and fix racial, gender or age biases in their recommendation algorithm. [Press Release](#).
- Analysing *Fair* ranking systems that have been published in CS literature and showing how they break down in the presence of noisy protected attribute data, to show the theoretical bounds of fairness in such cases.
- Investigated Facebook's Special Audiences system for opportunity advertisements and showed that the audience creation algorithm was still biased against women, old people and minorities. Covered in the media by [Propublica](#) and [Mother Jones](#).
- Investigated 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

Visiting Researcher | Advisor: Oana Goga

Grenoble, France

May 2019 – July 2019

- 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

Research Intern

Bangalore, India

May 2017 – July 2017

- Implemented XTrack, a Smart Vehicle Tracking and Battery usage minimizing Algorithm, using BLE to distribute 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

CSoc Student at OpenMRS

Remote

Apr 2016 – Aug 2016

- OpenMRS is an Opensource Medical Record System geared towards developing countries. I replaced the HTML XForms system used in the OpenMRS android client with native generated forms using the Forms REST Api and added offline form saving.
- Configured Travis CI to automatically build and push the apk to play store. Overall, contributed **100K lines of code**.

### IIT Kharagpur

Undergraduate Researcher | Advisors: Niloy Ganguly, Saptarshi Ghosh – CNERG Lab

Kharagpur, India

2014 – 2019

- Vector space representation of organic molecules to predict aqueous solubility (accurate upto  $0.68 R^2$ ) using machine learning techniques.
- Automated Extraction of Catchwords from Legal Documents using a novel NER based tagger to help categorize lengthy legal texts.
- Automatically position user comments against relevant news article paragraphs. Presented at [ECIR 2019](#).
- Savitr – A realtime 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 Papers

### Algorithms that "Don't See Color": Comparing Biases in Lookalike and Special Ad Audiences

Arxiv + Under Review '20

Piotr Sapiezynski, Avijit Ghosh, Levi Kaplan, Alan Mislove, Aaron Rieke

### Analyzing Political Advertisers' Use of Facebook's Targeting Features

Avijit Ghosh, Giridhari Venkatadri, Alan Mislove

Conpro '19

San Francisco, California

### Public Sphere 2.0: Targeted Commenting in Online News Media

Ankan Mullick, Sayan Ghosh\*, Ritam Dutt\*, Avijit Ghosh\*, Abhijnan Chakrabarty \*equal contribution

ECIR '19

Cologne, Germany

### SAVITR: A System for Real-time Location Extraction from Microblogs during Emergencies

Ritam Dutt, Kaustubh Hiware, Avijit Ghosh, Rameshwar Bhaskaran

WWW '18

Lyon, France

### WebSelect: A Research Prototype for Optimizing Ad Exposures based on Network Structure

Avijit Ghosh, Agam Gupta, Divya Sharma, Uttam Sarkar

WITS '16

Dublin, Ireland

## Awards & Grants

2019 **Winner**, Best Poster Award

ECIR'19

2019 **Winner**, Institute Order of Merit – Technology

IIT Kharagpur

2018 **Winner**, SGSIS Institute Challenge Grant – Worth INR 1 Million

IIT Kharagpur

## Skills

**Languages** Python, Java, C, R, Bash, SQL, HTML/CSS, JavaScript, Matlab  
**Frameworks** Git, Travis, Keras, TensorFlow, Docker, Google Cloud ML/AI, Android