Anjali Gupta

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Computer Science and Engineering
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Areas of Interest

Data Mining, Fairness, Bias in Algorithms, Machine Learning, Graph Neural Network, AI for social good, and Computational social choice

Education

Indian Institute of Technology, Delhi 2020 - Cont.
PhD in Computer Science and Engineering
Area : Algorithmic Fairness in Allocation Problems
CGPA - 9.6/10
Advisor: Prof. Sayan Ranu, Prof. Amitabha Bagchi

Delhi Technological University (Formerly Delhi College of Engineering), Delhi 2012 - 2014
M.Tech in Computer Science
CGPA - 8.7/10
Advisor: Prof. Daya Gupta, Dr. A.K. Bhateja (Director, DRDO)

Ajay Kumar Garg Engineering College, Ghaziabad 2008 - 2012
Affiliated to UP Technical University, Lucknow
B.Tech in Computer Science & Engineering
Percentage - 75.30%

Publications

"Towards Fair Allocation in Social Commerce Platforms", Anjali Gupta, Shreyans Nagori, Abhijnan Chakraborty, Rohit Vaish, Sayan Ranu, Prajit Nadkarni, Narendra Dasararaju and Muthusamy Chelliah, WWW, 2023
"FairFoody: Bringing in Fairness in Food Delivery", Anjali Gupta, Rahul Yadav, Ashish Nair, Abhijnan Chakraborty, Sayan Ranu, and Amitabha Bagchi, AAAI, 2022 (AR=4%, Oral Presentation).
"Gigs with Guarantees: Achieving Fair Wage for Food Delivery Workers", Ashish Nair, Rahul Yadav, Anjali Gupta, Abhijnan Chakraborty, Sayan Ranu, and Amitabha Bagchi, IJCAI, 2022.
"Empirical Validation of Website Quality Using Statistical and Machine Learning Methods", Poonam Dhiman, and Anjali, IEEE 5th International Conference on Confluence The Next Generation Information Technology, 2014.

Awards and Fellowships

Received **Received Google PhD Fellowship 2022**. Fellowship period: Oct 2022-Sep 2023
Received **Women in AI** award in category "AI in Innovation and Research" presented by WiDS Delhi @ Mastercard conference on "AI Revolution" 2024.
Received **Chandruka doctoral fellowship 2021**. Fellowship period: Jul 2021-Sep 2022.
Received **Best Teaching Assistance Awards**(2 times) for **Data Mining**, and **Introduction to Computer Science** Courses at IIT Delhi.

Experience

Data Scientist at Affle/RevX, Bangalore, (Jan 2016-Sep 2019).
Developed various business projects using Big Data and Machine learning techniques.
Performed multiple analysis on big data using R, shell scripting, xl, pig, hive etc.

Worked on the development of a model to predict app installs.
Participated in design discussions, training and code reviews.

Software Engineer at Arvind Ltd, Bangalore, (Sep 2015-Jan 2016)
Developed a tool for bulk conversion of product images in various sizes and to upload them with associated product in Hybris and AWS Glacier/S3.

Software Engineer at Nagarro, Gurgaon, (Jun 2014-Aug 2015)
Involved in design and development of e-commerce application for a well known electronic retailer using Hybris and J2EE.
Developed Ticketing System (Customer care service module) from scratch for e-commerce application.

Software Engineering Intern at C-DOT, Delhi, (Jun 2011-Jul 2011)

Projects

Differentially Private Coarsened Graph Neural Networks *Project at IIT Delhi*
In this project, we are trying to rectify the scalability and privacy issues in GNNs. We are working towards releasing a Differentially Private Coarsened Graph for GNN with Similarity Guarantees.

Persona-aware user embedding in e-commerce *Project at IIT Delhi in collaboration with Flipkart*
In this project we are trying to generate granular, data-backed segments of users (which will eventually be called personas) linked to different e-commerce categories based on shopping behaviour, demographics, surrounding users behavior, etc., to associate multiple preferences of a customer across several categories with various personas. For example, a user may be associated with personas like tech enthusiast in the Mobile/Electronics category, fashionista in the Lifestyle category, bookworm in the Books category, etc depending on their purchases

Individual Fairness under Group Fairness Constraints in Graph Neural Networks *Project at IIT Delhi*
Recent studies show that the node representations learned through GNN from discriminatory sensitive features in the data may explicitly inherit the existing societal biases and hence make the deployment of GNNs in high-stakes situations questionable. We aim to provide a fair GNN learning architecture which takes care of group as well as individual fairness in a scalable way.

Fair Allocation of products among Re-sellers in Social Commerce *Project at IIT Delhi in collaboration with Flipkart/Shopsy*
We aim to provide a fair recommendation scheme to assign products provided by sellers to re-sellers so that each seller and each re-seller are treated fairly in terms of opportunity and also try to optimize the revenue for both parties and hence for the e-commerce platform.

Efficient and fair distribution of food orders among restaurants and delivery agents *Project at IIT Delhi in collaboration with Dominos*
I am studying a different model of food delivery business, where an order may be serviced by any restaurant in the city. This work is funded by Dominos pizza, which adopts this model. To elaborate, Dominos has multiple restaurants in a city and an order may be serviced by any of these restaurants. How should orders be allocated to a restaurant? This is a complicated decision since the time to service an order depends on the current restaurant load, its infrastructure, proximity to delivery agents etc. Hence, we need to anticipate order volume and distribute these factors as uniformly as possible so that the aggregate delivery time is minimized.

Developed an algorithm to provide income/opportunity guarantees to delivery agents *Project at IIT Delhi*

- Developed an algorithm called WORK4FOOD to provides income guarantees to delivery agents, while minimizing platform costs and ensuring customer satisfaction.
- WORK4FOOD ensures that the income guarantees are met in such a way that it does not lead to increased working hours or degrade environmental impact.
- WORK4FOOD balances supply and demand by controlling the number of agents in the system and providing dynamic payment guarantees to agents based on factors such as agent location, ratings, etc.

Developed an algorithm to fairly distribute income/opportunity among delivery agents *Project at IIT Delhi*

- Performed analysis on data derived from a real-world food delivery platform across three large cities from India (along with their large graph of Road Network).
- Showed that there is significant inequality in the money delivery agents earn.
- Developed novel matching algorithm called FAIRFOODY for fair income distribution among agents while also ensuring timely food delivery.

PROGRAMMING SKILLS/TOOLS — Pig, Hive, Scala, Spark, R, C/C++, Java, Matlab, Python, Integer Linear Programing(ILP)

KEY-COURSES — Data Mining, Machine Learning, Graph Neural Network, Artificial Intelligence, Advanced Distributed Systems, Approximation Algorithms, Cryptography

MISCELLANEOUS — **Teaching assistant** (Data Mining, Database systems, Introduction to Computer Science) at IIT Delhi, 2020 - Cont.
Sub/External Reviewer: AAAI, VLDB, KDD, TKDE, NeurIPS and ICDM.
Qualified **UGC NET** June-2013.

REFERENCES

Prof. Sayan Ranu, Associate Professor, IIT Delhi sayanranu@iitd.ac.in
Prof. Rohit Vaish, Assistant Professor, IIT Delhi rvaish@iitd.ac.in
Prof. Abhijnan Chakraborty, Assistant Professor, IIT Delhi abhijnan@iitd.ac.in
Prof. Amitabha Bagchi, Professor, IIT Delhi bagchi@cse.iitd.ac.in