

# Ashutosh Tiwari

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## EDUCATION

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**Indiana University, Bloomington (Graduating 1<sup>st</sup> week May 2023)**

*Master of Science in Data Science (Computational and Analytical Track) 3.86/4.0*

Bloomington, IN

Aug. 2021 – May. 2023

**National Institute of Technology**

*Bachelor of Science in Computer Science 8.32/10.0*

Patna, India

Aug. 2011 – Jun. 2015

## PUBLICATIONS

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Scheduled to present in July, 2023 @NetSci Vienna.

[1] Ashutosh Tiwari, Sadamori Kojaku, Yong-Yeol Ahn, “Biased Contrastive Learning debiases Graph Neural Networks,” *International Conference on Network Science (NetSci)*, 2023.

- Have submitted @IC2S2 as **first** author on **Fairness Aware Recommendation System and Graph ML**, pending decision notification

## RESEARCH EXPERIENCE / INDEPENDENT STUDY

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- Implementing novel training frameworks that result in unbiased (or fair) models from “biased” datasets at IUNI with Prof. YY Ahn and Prof. S Kojaku as part of my Independent Study. Summer 2022 - Present
- Working as a paid RA for, “**User Intent as a Network**” with Prof. YY Ahn, P Kantak and FB Yara. Project is funded by Kelly Business School. Goal is to be able to quantify and thus act upon that “intent” network. Summer 2022 - Fall 2022
- Was part of NLP Lab@IUB with Prof. D Cavar. Contributed to design of TieML and Events’ Timeline modelling. Fall 2021

## WORK EXPERIENCE

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**Senior Software Dev Engineer (ML Platform)**

Jan. 2019 – Jul. 2021

SWIGGY

*DATA SCIENCE PLATFORM, TIME SERIES FORECASTING*

- Was part of team that worked on Feature Store and pipeline which feeds on-demand features to deployed ML models at production scale (4Bn rows, 1Mn QPS / day). Pipeline supported multichannel ingestion, i.e. Spark, Flink and user files etc.
- Founding member of Forecasting and Correlation Platform which was considered by many teams to forecast concerned time series. These forecasts power critical scaling decisions across organizations in real time.
- Led DAQ, a tool used to scrape APIs at scale. Used to collect data for analysis/ model training at a scale of 15 M rows daily.

**Software Development Engineer (NLP)**

Sep. 2017 – Jan. 2019

FLIPKART (a Walmart company)

*SEARCH RELEVANCE, QUERY INTENT, NLP*

- Was responsible for improvements/inception of search intent models (CRF/Neural Network based), identifying error classes, coming up with solutions, and fixing them. These models power user search and discovery for millions every day.
- Implemented a FastText based query store classifier, which predicts the category of a tail query.
- Implemented the first workflow to automate training and auto-deployment of various search models in Flipkart. First was written using Luigi and later migrated to Airflow.
- Wrote a generic framework using Airflow which at runtime creates generic dags for different ML models and orchestrates their training to deployment flow, including data and model validations.
- Implemented large scale (4Bn+ datapoints) pipelines using Cascading/HDFS to extract data from user events and then transform it to be used for training these models.

**Software Development Engineer**

Sep. 2016 – Sep. 2017

GROUPON

*BACKEND ENGINEERING*

- Worked on a component called Cyclops, an interface between Customer representatives and internal services.

**Software Engineer**

Sep. 2015 – Aug. 2016

NETSPEED SYSTEMS (Acquired by Intel)

*GRAPH ALGORITHMS, NETWORK ON CHIP*

- Led engineering efforts on modules like Polarity based Arbitration, Multi-Cast Filtering, Structural Latency Breakdown etc.

## TEACHING EXPERIENCE

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Teaching Assistant for Network Science (INFO-I 606) with Prof. YY Ahn

Spring 2023

Teaching Assistant for Machine Learning (CSCI-B 555) with Prof. R Khardon

Fall 2022

Teaching Assistant for Network Science (INFO-I 606) with Prof. YY Ahn

Spring 2022

## SELECTED PROJECTS

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<b>BiasNet</b>   <i>Deep Reinforcement Learning, PyTorch, Actor Critic Algorithm, On-policy Model Free</i>	<a href="#">Code/Report</a>
• Learning to fight in <u>Street Fighter II</u> with induced relational bias from differential game scenes.	
<b>DeepFoodie</b>   <i>Python, Tensorflow, Self Supervised Deep Clustering, Deep Learning, Transfer Learning</i>	<a href="#">Code/Report</a>
• Clustering dishes on basis of their ingredient embeddings. These ingredient embeddings are generated by a NN.	
<b>BlindNet</b>   <i>Python, Pytorch, Deep Learning, Transfer Learning</i>	<a href="#">Code/Report</a>
• Image to vector generation on Coco dataset.	
<b>Continuous Dominant Set Repair</b>   <i>C++, Graph Algorithms, Guha and Khuller's Algo., Greedy</i>	<a href="#">Code</a>
• Repairs a broken link in Continuous Dominant Set in $O(\Delta^2)$ , where $\Delta$ being the avg cardinality of connected graph.	
<b>Humana Mays Healthcare Analytics Case Competition</b>   <i>Boosted Trees, Feature Engineering</i>	<a href="#">Code</a>
• 11th <u>rank</u> on leaderboard. Hosted by TAMU and Humana Mays, 2021.	
<b>AnalyticsVidhya Solutions</b>   <i>Python, Tensorflow, Torch, Time Series, Feature Engineering, Catboost</i>	<a href="#">Code</a>
<b>Investigating Bias Manifolds</b>   <i>Bias Manifolds, Bias Progression, Measuring Bias, Python, Word2vec</i>	<a href="#">Code/Report</a>

## TECHNICAL SKILLS

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Search Relevance, Recommendations, Graph Neural Networks, Fairness Aware Modeling, Computational ML, NLP, Computer Vision, DL, Spark, Python, Scala, C++, Contrastive Learning

**Frameworks/Libraries/Tools:** Pytorch Geometric, Pytorch, Tensorflow, Sklearn, Numpy, Pandas, Matplotlib, AWS, HDFS

## RELEVANT COURSES SO FAR

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Computational ML(B555), Deep Learning(E533), Reinforcement Learning(B659), Computer Vision(B657), Statistics(S520), Independent Study (Working on Fairness Aware AI and Bias manifolds in Graph ML), Advanced Database Systems(B561)