

# ARJUN ROY

## Machine Learning Researcher

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## EXPERIENCE

### Researcher on EU Horizon project MAMMOth

#### Research Institute CODE

June 2023 – Ongoing Munich, Germany

- Leading efforts to develop fair models by gradient conflict resolution in Multi-task Learning.
- Supervising efforts to develop robust ML models against adversarial attacks and reconstruction attacks.
- Contributing to a team efforts focused on bias identification and mitigation during Multi-modal fusion.

### Researcher on Volkswagen Foundation Project BIAS

#### L3S Research Center

Sept 2019 – May 2023 Hannover, Germany

- Interdisciplinary research, spearheaded the study of ethical algorithm that juxtaposes fair-ML with anti-discrimination laws.
- Addressed technical challenges in fairness-aware learning, focusing on multiple protected attributes and class-imbalance.
- Introduced student-teacher learning framework for fair-MTL, where an RL agent (teacher) decides optimization objective for a MTL (student) at each training step.

### Visiting Researcher

#### Information Technologies Institute-CERTH

Sept 2022 – Nov 2022 Thessaloniki, Greece

- Worked on the topic of 'Grouping MTLs' using parameter similarity between tasks.

### Research Intern

#### L3S Research Center

Sept 2018 – March 2019 Hannover, Germany

- Under prestigious DAAD scholarship, as part of my Master's (MTech) thesis work, developed a pipeline based solution for 'Stance detection' in news headlines.
- The research played a pivotal role in shaping up my master's thesis, aimed at automated 'Fake news detection', where stances of related articles were used to examine veracity of a given news.

## STRENGTHS

Hard-working

Mentally & Physically strong

Creative & Innovator

Leader

Good Communicator

## LANGUAGES

English



German



## LIFE PHILOSOPHY

"Creativity is intelligence having fun!"  
- Albert Einstein

## EDUCATION

### Ph.D. in Computer Science

#### Freie Universität Berlin

Nov 2021 - Ongoing Berlin, Germany

### M.Tech. in Math. & Computing

#### IIT Patna, 9.16/10 CPI (Summa cum laude)

Aug 2017 - July 2019 Patna, India

### Masters in Computer Application

#### IGNOU, 62.14/100 % (Magna cum laude)

Oct 2013 - Dec 2016 Kolkata, India

## MOST PROUD OF

### Awards I Received

- i) DAAD scholarship for Master's thesis, ii) GATE (Graduate Aptitude Test in Engineering) top 3% rank in India.

### Persistence & Loyalty

I relocated to three different cities to work closely with my Ph.D. supervisor.

### Leadership Ability

served as the post graduate representative at IITP, and as Vice President of Indian diaspora, Hannover.

## TECHNICAL SKILLS

### Professional

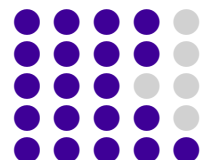
Coding

Debugging

DBMS

Documentation

Presentation



### Programming

Python

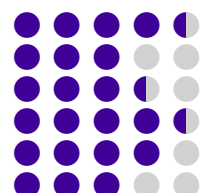
C/C++

SQL

Pytorch

Keras

Tensorflow



## PUBLICATIONS

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Total citations: 504 (till last update)

- E. Panagiotou, A. Roy, and E. Ntoutsis, "Synthetic tabular data generation for class imbalance and fairness: A comparative study," *arXiv preprint arXiv:2409.05215*, 2024.
  - C. K. Ramanaik, A. Roy, and E. Ntoutsis, "Adversarial robustness of vaes across intersectional subgroups," *arXiv preprint*, 2024.
  - A. Roy, C. Koutlis, S. Papadopoulos, and E. Ntoutsis, "Fairbranch: Mitigating bias transfer in fair multi-task learning," in *IEEE-IJCNN*, 2024.
  - S. Swati, A. Roy, and E. Ntoutsis, "Exploring fusion techniques in multimodal ai-based recruitment: Insights from faircvdb," in *EWAF*, 2024.
  - A. Roy, J. Horstmann, and E. Ntoutsis, "Multi-dimensional discrimination in law and machine learning-a comparative overview," in *ACM-FAccT*, 2023.
  - V. Iosifidis, A. Roy, and E. Ntoutsis, "Parity-based cumulative fairness-aware boosting," *KAIS*, 2022.
  - T. Le Quy, A. Roy, V. Iosifidis, W. Zhang, and E. Ntoutsis, "A survey on datasets for fairness-aware machine learning," *Wiley: DMKDD*, 2022.
  - A. Roy, P. Fafalios, A. Ekbal, X. Zhu, and S. Dietze, "Exploiting stance hierarchies for cost-sensitive stance detection of web documents," *JIS*, 2022.
  - A. Roy, V. Iosifidis, and E. Ntoutsis, "Multi-fairness under class-imbalance," in *Discovery Science*, Springer, 2022.
  - A. Roy and E. Ntoutsis, "Learning to teach fairness-aware deep multi-task learning," in *ECML-PKDD*, 2022.
  - T. Le Quy, A. Roy, G. Friege, and E. Ntoutsis, "Fair-capacitated clustering.," in *EDM*, 2021.
  - A. Roy and A. Ekbal, "Mulcob-mulfav: Multimodal content based multilingual fact verification," in *IEEE-IJCNN*, IEEE, 2021.
  - A. Roy, K. Basak, A. Ekbal, and P. Bhattacharyya, "A deep ensemble framework for fake news detection and multi-class classification of short political statements," in *ICNLP*, 2019.
  - A. Roy, P. Kapil, K. Basak, and A. Ekbal, "An ensemble approach for aggression identification in english and hindi text," in *TRAC Workshop*, 2018.
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## REFEREES

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**Prof. Eirini Ntoutsis**

📍 Universität der Bundeswehr München

✉ [eirini.ntoutsis@unibw.de](mailto:eirini.ntoutsis@unibw.de)

🌐 [aiml-research.github.io](https://aiml-research.github.io)

Working under her supervision for my Ph.D. on the topic Multi-criteria of fairness-aware Machine Learning.

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**Prof. Asif Ekbal**

📍 IIT Jodhpur

✉ [asif@iitj.ac.in](mailto:asif@iitj.ac.in)

🌐 [ekbalasif.github.io](https://ekbalasif.github.io)

Worked under his guidance for my M.Tech. thesis on the topic Fake-news Detection.

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