Arjun **Roy**

Machine Learning | Researcher

About me

I'm Arjun Roy, a seasoned researcher with over five years of dedicated experience in machine learning. Currently, I'm affiliated with Research Institute CODE (Cyber Defence and Smart Data) at Universität der Bundeswehr München, actively engaged in the EU project MAMMOth. Previously, I conducted research at L3S Research Center in Hannover, funded by the Volkswagen Foundation. My expertise spans various domains in machine learning, including FairML, Multi-task Learning, Deep Reinforcement Learning, and more. I earned my master's degree in Mathematics and Computing from the esteemed Indian Institute of Technology Patna, currently pursuing a doctorate in machine learning at Freie Universität Berlin, Germany.

Contact

✉ arjun.roy@unibw.de

✉ +49 15166421952

📍 Keltenstr. 2b
82031 Grünwald, Germany

in arjun-roy-fub

○ arjunroyihrpa

g+ arjun roy

▶ @arjunroyihrpa

Languages

🇬🇧 English - Professional Knowledge

🇩🇪 German - Basic Knowledge

sites.google.com/view/arjunroy/home

🎓 EDUCATION

2021-Ongoing	**Doctorate** 📍 Berlin, Germany **Freie Universität Berlin** *Dept. of Mathematics and Computer Science* Working on the topic of Multi-criteria of fairness-aware Machine Learning under the guidance of Prof. Dr Eirini Ntoutsi.
2017-2019	**Master Degree** 📍 Patna, India **Indian Institute of Technology Patna** *Dept. of Mathematics* Received Master of Technology degree in Mathematics & Computing with the thesis title 'Fake News Detection' under the guidance of Prof. Dr Pushpak Bhattacharyya, Dr Asif Ekbal, and Prof. Dr Stefan Dietze. **Degree: 9.16/10 CPI (Summa cum laude)**
2013-2016	**Master Degree** 📍 Kolkata, India **St. Xavier's College (IGNOU)** *Dept. of Computer Science* Received Master of Computer Application degree with the thesis title 'Online Journal Management' under the guidance of Assoc. Prof. Shalabh Agarwal. **Degree: 62.14/100 (Magna cum laude)**

💼 WORK EXPERIENCE

|	
2023 - till date	**Researcher** 📍 Munich, Germany *Research Institute CODE* Currently employed at the Research Institute CODE, Universität der Bundeswehr München, working on the EU Horizon project MAMMOth. I am leading efforts to develop fair-ML models for resolving conflicts in fair-MTL and ensuring privacy against backdoor attacks in federated learning. The goal is to enhance model robustness against bias, knowledge loss, and membership inference attacks, while delivering a financial decision-making model to Exus and an identity verification model to ID-Now. Additionally, I contribute to a team working on multimodal bias identification and mitigation, ensuring fair and secure model across diverse data modalities.
2019 - 2023	**Researcher** 📍 Hannover, Germany *L3S Research Center* During my tenure I worked on at Project BIAS, funded by the VW Foundation, I had the privilege to contribute to an interdisciplinary research endeavor uniting experts from philosophy, law, and computer science. My role involved orchestrating collaboration between the philosophical and legal teams, fostering an understanding of societal biases and fairness principles. Subsequently, I spearheaded the development of ethical algorithms aimed at assessing and mitigating biases, while ensuring alignment with anti-discrimination laws. Addressing the technical complexities inherent in the project, I navigated multi-objective challenges inherent in fairness-aware learning, particularly concerning multiple protected attributes, while maintaining high predictive performance across all classes.
2022 - 2023	**Visiting Researcher** 📍 Munich, Germany *Research Institute CODE* My job was to develop the necessary tools and techniques for the discovery and mitigation of (multi-)discrimination in tabular, visual, and graph data. The goal is to demonstrate through pilots the developed solutions into three relevant sectors of interest: a) finance/loan applications, b) identity verification systems, and c) academic evaluation.

Soft Skills and Strengths
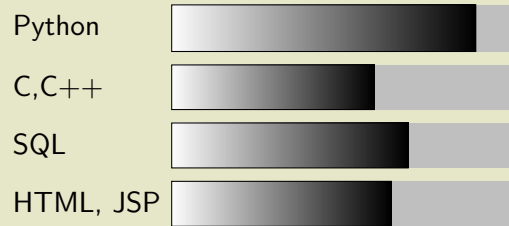
`Creative` `Flexible` `Confident` `Innovator`
`Problem Solving` `Team Work` `Leadership`
`Good Communication` `Diplomacy` `Patience`

Professional Skills

Coding

Debugging

DBMS
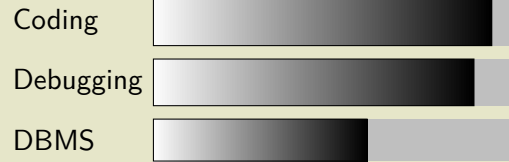
Programming Languages

Python

C, C++

SQL

HTML, JSP

Deep Learning Frameworks

Pytorch

Keras

Tensorflow
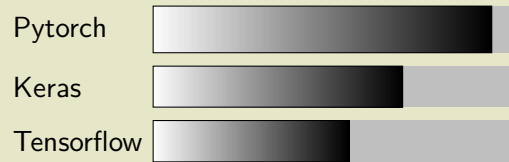
Teaching Skills

- Tutorials, Artificial Intelligence (UniBw, 2024)
- Tutorials, Artificial Intelligence (UniBw, 2023)
- Tutorials, Reinforcement Learning (FUB, 2021-22)
- Tutorials, Data Mining (LUH, 2020-21)

Other Interests

- Guitar 🎸
- Chess ♟
- Gym 🏋
- Travels ✈
- Climbing 🧗
- Books 📚

✺ Awards

- 🔵 DAAD (Deutscher Akademischer Austauschdienst) Scholarship for Master's Thesis work (2018)
- Graduate Aptitude Test in Engineering (GATE): top 3% rank in India, awarded Scholarship for master's studies.

Download My CV

Scan the QR below to get the latest version of my CV:

💼 WORK EXPERIENCE

2022-2022 | **Visiting Researcher**   📍 Thessaloniki, Greece
Information Technologies Institute-CERTH
Worked on the topic of 'Grouping Fairness-aware Multi-Tasking NN'. My focus here was to develop algorithms that in training performs a network architecture search within a Multi-task Learning setup that groups tasks together to improve per-task fairness and accuracy (positive and fairness-aware transfer of inter-task information).

2018-2019 | **Research Intern**   📍 Hannover, Germany
L3S Research Center
Working on the topic of 'Stance Detection'. I along with Dr Fafalios under the guidance of Prof. Dr. Dietze developed a pipeline algorithm that searches for relevant documents for a given claim and finds the agree/disagree stance of such relevant documents.

📖 PUBLICATIONS

Total citations: 504 (till last update)

Ramanaik, C. K., Roy, A., & Ntoutsi, E. (2024). Adversarial robustness of vaes across intersectional subgroups. *arXiv preprint*.

Swati, S., Roy, A., & Ntoutsi, E. (2024). Exploring fusion techniques in multimodal ai-based recruitment: Insights from faircvdb. *EWAF*.

Roy, A., Koutlis, C., Papadopoulos, S., & Ntoutsi, E. (2024). Fairbranch: Mitigating bias transfer in fair multi-task learning. *IEEE-IJCNN*.

Panagiotou, E., Roy, A., & Ntoutsi, E. (2024). Synthetic tabular data generation for class imbalance and fairness: A comparative study. *arXiv preprint arXiv:2409.05215*.

Roy, A., Horstmann, J., & Ntoutsi, E. (2023). Multi-dimensional discrimination in law and machine learning-a comparative overview. *ACM-FAccT*.

Roy, A., Fafalios, P., Ekbal, A., Zhu, X., & Dietze, S. (2022). Exploiting stance hierarchies for cost-sensitive stance detection of web documents. *JIIS*.

Roy, A., & Ntoutsi, E. (2022). Learning to teach fairness-aware deep multi-task learning. *ECML-PKDD*.

Roy, A., Iosifidis, V., & Ntoutsi, E. (2022). Multi-fairness under class-imbalance. *Discovery Science*.

Iosifidis, V., Roy, A., & Ntoutsi, E. (2022). Parity-based cumulative fairness-aware boosting. *KAIS*.

Le Quy, T., Roy, A., Iosifidis, V., Zhang, W., & Ntoutsi, E. (2022). A survey on datasets for fairness-aware machine learning. *Wiley: DMKDD*.

Le Quy, T., Roy, A., Friege, G., & Ntoutsi, E. (2021). Fair-capacitated clustering. *EDM*.

Roy, A., & Ekbal, A. (2021). Mulcob-mulfav: Multimodal content based multilingual fact verification. *IEEE-IJCNN)*.

Roy, A., Basak, K., Ekbal, A., & Bhattacharyya, P. (2019). A deep ensemble framework for fake news detection and multi-class classification of short political statements. *ICNLP*.

Roy, A., Kapil, P., Basak, K., & Ekbal, A. (2018). An ensemble approach for aggression identification in english and hindi text. *TRAC Workshop*.