

DR. JOYMALLYA CHAKRABORTY

<https://joymallya.github.io/> ♦ Github: github.com/joymallya
808A 16th Avenue, Seattle, WA 98122

Email : joymallya@amazon.com

Mobile : +1-919-633-2503

EDUCATION

Ph.D. in Computer Science

North Carolina State University, Advisor - Dr. Tim Menzies (timm@ieee.org)

Aug. 2017 – March 2022

Raleigh, NC

BE in Computer Science

Jadavpur University

Jun 2011 – Jun 2015

Kolkata, India

TECHNICAL SKILLS

General Expertise: Generative AI, Large Language Models, Deep Learning, Data Science, Software Engineering;

Programming: Proficient: Python (8+ years), C/C++/Java (6+ years). Working Knowledge: R, SQL, AngularJS, CUDA, NodeJS;

DevOps: Docker, Kubernetes, AWS;

WORK EXPERIENCE

Amazon.com Services, LLC

Applied Scientist, Amazon Science

501 Fairview Ave N, Seattle, WA 98109

May 2022 - Present

- Member of the ML Science team responsible for detecting seller fraud and abuse patterns through ML model development and data analytics
- Part of the Core Systems team driving large-scale data analysis using AWS services (SageMaker, S3, Lambda) and distributed computing frameworks
- Works as a Cross-functional stakeholder collaborating with business, engineering, and risk managers to implement solutions
- Supports Technical Operations team monitoring model health and business metrics using Python (PyTorch, scikit-learn), SQL, and AWS CloudWatch.

Languages: Python, SQL, GraphQL; **Frameworks:** AWS, Bedrock, Graph Neural Networks, Deep Learning

Amazon.com Services, LLC

Applied Scientist Intern, Abuse Detection

501 Fairview Ave N, Seattle, WA 98109

May 2021 - Aug. 2021

- Worked as a member of the Abuse Prevention Science team to find emerging abuse on Amazon Product Detail Page.

Languages: Python, SQL; **Frameworks:** AWS, Cradle, Deep Learning

IBM Research

Ph.D. Research Intern, System Design

1101 Kitchawan Rd, Yorktown Heights, NY 10598

May 2020 - Aug. 2020

- Worked on State Management & Persistence in Mono2Micro which converts Monolith applications to Microservices.

Languages: Java; **Frameworks:** Kubernetes, Redis, RabbitMQ

Intel Corporation

Software Engineering Research Intern, Deep Learning

2700 156th Ave NE, Bellevue, WA 98007

May 2019 - Aug. 2019

- Worked on computational graph optimization and post-training quantization of CNN models.

Languages: C++, Python; **Frameworks:** Onnxruntime, Ngraph, TensorFlow, **Model:** Resnet50

Intel Corporation

Software Engineering Research Intern, Compiler Optimization

2700 156th Ave NE, Bellevue, WA 98007

May 2018 - Aug 2018

- Explored optimization opportunities of .NET Core Garbage Collection and implemented PoC (Proof of Concept) prototypes.

Languages: C++, .NET; **Frameworks:** .NET Framework, VTune

TCG Digital

Software Developer, Java & AngularJS

Kolkata, India

June 2015 - July 2017

- Worked in a Business Intelligence Software to retrieve, analyze, transform and report business related data.

Languages: Java, Bootstrap, JQuery, Angular JS, Node JS, Require JS, C3 JS, D3 JS; **Frameworks:** Elasticsearch

TEACHING EXPERIENCE

CSC520: Artificial Intelligence

Fall 2018

Graduate Course

- Helped teach a class on artificial intelligence to a class of 95 graduate students.
- Offered guest lectures on some popular abstractions in various machine learning algorithms.
- Aided in the design and evaluations of homework assignments and examinations.

CSC326: Software Engineering

Spring 2018

Senior Level Undergraduate Course

- Assisted in teaching the foundations of software engineering principles to a class of 130 undergraduate students.
- Assisted in designing and grading homework assignments and mid-semester examinations.
- Assisted in mentoring 3 distinct class projects on applying software engineering to solve the real-world problems.

CSC230: C & Software Tools

Fall 2017

Sophomore Level Undergraduate Course

- Aided in teaching the principles of C computer language coding to a class of 110 undergraduate students.
- Assisted in designing and grading homework assignments, mid-semester examinations, and final project reports.

PROFESSIONAL SERVICE

Technical Reviewer: Reviewed several papers for Empirical Software Engineering, IEEE Transactions on Software Engineering, Automated Software Engineering, and ACM Transactions on Software Engineering and Methodology.

Program Committee: Selected as a Program Committee member for WAM 2023.

Program Committee: Selected as a Program Committee member for Fairware 2022 & 2023.

INVITED TALKS

University of Delaware: Invited by Dr. Lori Pollock to give a lecture on “software fairness” in the Computer Science department of University of Delaware.

ICSE 2022 (Pittsburgh, USA): Presented “Fair-SSL: Building fair ML Software with less data” paper in Fairware workshop.

ESEC/FSE 2021 (Virtual): Presented “Bias in Machine Learning Software: Why? How? What to do?” paper in the research track.

ASE 2020 (Melbourne, Australia): Presented “Making Fair ML Software using Trustworthy Explanation” paper in the NIER track.

ESEC/FSE 2020 (Sacramento, USA): Presented “Fairway: A way to build fair ML Software” paper in the research track.

ESEC/FSE 2019 (Tallinn, Estonia): Presented “Predicting Breakdowns in Cloud Services (with SPIKE)” paper in the industry track.

ASE 2019 (San Diego, USA): Presented “Software Engineering for Fairness: A Case Study with Hyperparameter Optimization” in the LBR workshop.

SELECTED PUBLICATIONS

- [1] Chakraborty J., Xia W., “*Detoxbench: Benchmarking large language models for multitask fraud & abuse detection*”. In **International Conference on Knowledge Discovery and Data Mining (KDD 2024)**. Online: <https://www.amazon.science/publications/detoxbench-benchmarking-large-language-models-for-multitask-fraud-abuse-detection>;
- [2] Peng K., Chakraborty J., Menzies T., “*FairMask: Better Fairness via Model-based Rebalancing of Protected Attributes*”. In **IEEE Transactions on Software Engineering (TSE) 2022**. Online: <https://ieeexplore.ieee.org/abstract/document/9951398>;
- [3] Majumder S., Chakraborty J., B. Gina., Stolee K., Menzies T., “*Fair Enough: Searching for Sufficient Measures of Fairness*”. In **ACM Transactions on Software Engineering and Methodology, 2023**. Online: <https://arxiv.org/pdf/2110.13029.pdf>;
- [4] Chakraborty J., Majumder S., Huy Tu., “*Fair-SSL: Building fair ML Software with less data*”. In **International Workshop on Equitable Data and Technology (FairWare), 2022**. Online: <https://arxiv.org/abs/2111.02038>;
- [5] Chakraborty J., Majumder S., Menzies T., “*Bias in Machine Learning Software: Why? How? What to do?*”. In **Foundations of Software Engineering (ESEC/FSE), 2021**. Online: <https://arxiv.org/abs/2105.12195>; 🏆 **ACM SIGSOFT Distinguished Paper Award Winner**
- [6] Chakraborty J., Majumder S., Yu Z., Menzies T., “*Fairway: A Way to Build Fair ML Software*”. In **Foundations of Software Engineering (ESEC/FSE), 2020**. Online: <https://dl.acm.org/doi/10.1145/3368089.3409697>;
- [7] Chakraborty J., Peng K., Menzies T., “*Making Fair ML Software using Trustworthy Explanation*”. In **International Conference on Automated Software Engineering (ASE), 2020**. Online: <https://dl.acm.org/doi/10.1145/3324884.3418932>;
- [8] Chen J., Chakraborty J., & Menzies T., “*Predicting Breakdowns in Cloud Services (with SPIKE)*”. In **Foundations of Software Engineering (ESEC/FSE), 2019**. Online: <https://dl.acm.org/doi/abs/10.1145/3338906.3340450>;
- [9] Imtiaz N., Middleton J., Chakraborty J., “*Investigating the Effects of Gender Bias on GitHub*” In **International Conference on Software Engineering (ICSE), 2019**. Online: <https://ai.google/research/pubs/pub47860>;
- [10] Chakraborty J., Xia T., Fahid M., Menzies T., “*Software engineering for fairness: A case study with hyperparameter optimization*” In **International Conference on Automated Software Engineering (ASE), 2019**. Online: <https://arxiv.org/abs/1905.05786>;
- [11] Chakraborty M., Chowdhury S., Chakraborty J., Mehera R., Pal R., “*Algorithms for generating all possible spanning trees of a simple undirected connected graph: an extensive review*” In **Complex & Intelligent Systems (Springer), 2018**. Online: <https://link.springer.com/article/10.1007/s40747-018-0079-7>;