Madhurima Chakraborty

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My Webpage
Github
Linkedin

PhD candidate, CSE, UCR

Research Interest

I am broadly interested in the applied and fundamental aspects of programming languages, applications of software engineering and intelligent decision making; particularly developing structured program analysis and automated software testing/debugging techniques. My current research focuses at the intersection of machine learning and program analysis.

Experience

Research

9/2019 – present **Graduate Student Researcher**, *University of California*, Riverside, CA
Designed robust Static Call Graph techniques for modern JavaScript applications, enhancing crucial function and call edge discovery. Bridged machine learning and program analysis, contributing to cutting-edge research at the intersection of the two fields.

Teaching

Fall 2020/21: **CS180: Introduction to Software Engineering**, CS, *UC Riverside*.

Spring 2021: **CS206: Advanced Software Testing and Analysis**, CS, *UC Riverside*.

Internship

6/2022 – 9/2022 **Research Intern**, *Microsoft Research*, Redmond, WA, USA
Investigated the application of machine learning to detect defects in code using static analysis techniques and large language models. Collaborated with mentors on groundbreaking research in defect detection and resolution.
Mentors: Xavier Fernandes, Ben Zorn, Shuvendu Lahiri

Work

1/2018 – 5/2019 **Product Specialist**, *Cognizant*, WB, India
Successfully migrated mainframe-based applications to Java APIs, leveraging Java and H-Base for enhanced efficiency.

8/2015 - 12/2017 **Senior Systems Engineer**, *Infosys*, Orissa, India
Contributed to the development and maintenance of Mainframe applications, showcasing strong technical prowess.

Publications

2022 Madhurima Chakraborty, Renzo Olivares, Manu Sridharan, and Behnaz Hassanshahi. Automatic root cause quantification for missing edges in javascript call graphs. In *36th European Conference on Object-Oriented Programming (ECOOP 2022)*, 2022.

2021 M Chakraborty. A study of call graph effectiveness for framework-based web applications. In *Companion Proceedings of the 2021 ACM SIGPLAN International Conference on Systems, Programming, Languages, and Applications: Software for Humanity*, SPLASH Companion 2021, page 13–15, 2021.

Accolades & Honors

Academic

2023 **Twelfth Summer School on Formal Techniques**, *SRI*.

2022 **ACM Student Research Competition Grand Finals: Third Place, Graduate Category**, *ACM*.

2021 **SPLASH 2021 Student Research Competition : Winner, Graduate Category**, *Splash*.

2020 **WiML ICLR 2020 Travel Grant**, *Women in Machine Learning*.

2020 **Bug recognized at DeepCode's Bug Bounty program**, *DeepCode.ai*.

2021 **Programming Language Implementation Summer School**, .

2019 **Dean's Distinguished Fellowship**, *UC Riverside*.

2018 **Google Nanodegree Scholarship to Front End Web Developer**, *Google India & Udacity*.

2018 **Shortlisted for International Women's Hackathon**, *Hackerearth*.

Professional

2018 **1 Star Award**, *Cognizant Technology Solutions*.
For exceptional performance over the quarter

2017 **Insta Award**, *Infosys Limited*.
For successful implementation of a critical high visibility project

2017 **Insta Award**, *Infosys Limited*.
For excellent analytical skills

2016 **High Performer Trainee**, *Infosys Limited*.
Awarded to top 10% employees

Extracurricular

2017 **Division-level Public Speaking Champion**, *Toastmasters International*.

2017 **Triple Crown Award**, *Toastmasters International*.

Technical skills

Languages: JavaScript, Python, Java, C/C++, SQL, Bash, Cobol

Libraries: numpy, pandas, scikit-learn, PyTorch, CodeBert

Developer Tools: Git, Docker

JavaScript Libraries, Frameworks and Tools: Node.js, Express.js, Jest, Puppeteer, WALA, Jalangi2

Education

09/2019–now **Ph.D. in Computer Science & Engineering**, *University of California*, Riverside, CA, USA.
CGPA: **3.86**/4 Advisor: Manu Sridharan

Relevant Courses: Compiler Construction, Advanced Software Testing And Analysis, Software Verification, Advanced Program Analysis

07/2011–05/2015 **Bachelor of Technology in Information Technology**, *RCC IIT*, Kolkata, WB, India.
CGPA: **8.6**/10 Class Rank: **3**/103

Synergistic Activities

Program Committee : SAS'22 (AEC).

External Reviewer: ECML PKDD'22.

Mentor: Open Source Day Summer'21.

Undergraduate Research Mentor: Renzo Olivares.

Student Volunteer: PLDI'20 , SPLASH'20.