

Satyaki Das

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RESEARCH THEME

My research aims to enhance the security of software systems by using deep learning to identify, localize, and fix vulnerabilities in source code. I'm currently focusing on addressing challenges in generalization and localization of vulnerabilities by employing AI interpretability techniques and designing new neural network architectures and loss functions. Ultimately, I intend to help developers by automating the generation of security patches.

PUBLICATIONS

- Sejfia, A., Das, S., Shafiq, S., & Medvidović, N. (2023, November). Toward Improved Deep Learning-based Vulnerability Detection. In 2024 IEEE/ACM 46th International Conference on Software Engineering (ICSE) (pp. 730-741). IEEE Computer Society.
- Das, S., Fabiha, S. T., Shafiq, S., & Medvidović, N. (2025). Are We Learning the Right Features? A Framework for Evaluating DL-Based Software Vulnerability Detection Solutions. In 2025 IEEE/ACM 47th International Conference on Software Engineering (ICSE) (pp. 2893-2904). IEEE Computer Society.

EDUCATION

Ph.D in Computer Science <i>University of Southern California</i>	2021 - 2026 (expected)
M.Sc in Computer Science <i>University of Southern California</i>	Aug 2021 - May 2025
B.Sc in Software Engineering <i>Institute of Information Technology, University of Dhaka</i>	2015 - 2019

PROFESSIONAL EXPERIENCE

University of Southern California <i>Graduate Research Assistant</i>	Los Angeles, California Jan 2022 - Present
- Published findings on the performance of the current state-of-the-art in detecting complex vulnerabilities - Published findings on the reasoning behind the predictions of the state-of-the-art vulnerability detectors	
University of Southern California <i>Graduate Teaching Assistant</i>	Los Angeles, California Jan 2023 - Present
- CSCI-585: Database Systems (Summer 2023, Summer 2024, Summer 2025) - CSCI-591: Computer Science Research Colloquium (Fall 2024, Spring 2025) - CSCI-104: Data Structures and Object-Oriented Design (Spring 2023, Fall 2023)	
University of Liberal Arts Bangladesh <i>Lecturer</i>	Dhaka, Bangladesh Oct 2019 - On Study Leave
- Taught Software Engineering, Automata and Theory of Computing, Data Structures, Algorithms	
Samsung Research & Development Institute Bangladesh <i>Software Engineer</i>	Dhaka, Bangladesh Feb 2019 - Sep 2019
- Migrated Samsung's Network Department's Device Management System (DIMS) from a desktop application to a web-based platform using Angular, expanding accessibility to a broader user base and improving data retrieval and system performance - Developed a responsive user interface for DIMS, enhancing user experience across various devices and screen sizes - Collaborated with backend engineers to integrate RESTful APIs - Implemented role-based access control in the frontend, strengthening security by ensuring appropriate user permissions	
Samsung Research & Development Institute Bangladesh <i>Software Engineering Intern</i>	Dhaka, Bangladesh Jan 2018 - Jun 2018
- Built a prototype Generative Adversarial Network (GAN) that implements neural style transfer	

SKILLS

Languages: Python, C, C++, Java HTML, CSS, PHP, C#, Javascript, Typescript
Frameworks: PyTorch, Tensorflow, Keras, Angular, ASP.NET, Django, Flask, MySQL, Oracle, MongoDB
Areas: Deep Learning, Software Security, Software Engineering
DevOps: Azure, AWS, Docker

ACADEMIC COMMUNITY SERVICE

CONFERENCES.....

- PC Member, FSE–Artifacts Track (2025)
- Sub-reviewer, EASE 2025
- Sub-reviewer, AAAI 2026

WORKSHOPS.....

- PC Member, SVM 2026

SELECTED ACADEMIC PROJECTS

IPS

- Developed an image filtering software that takes an image as input and applies filters such as Pencil Sketch and Blur

AudioEditor— An audio editing software

- Built a desktop application to edit audio files, such as cutting, joining, reversing, etc.

PGDIT Automation System — Automation of PGDIT course of IIT, DU

- Developed a web-based application that automates the entire working process of the PGDIT program at IIT, DU, including the admission system, result generation system, etc.

CSRepo — Metadata Repository for Computing Conferences

- Developed web services that provide metadata of various papers related to computers and computing problems.
- Automated the process of collecting metadata for services similar to the DBLP Computer Science Bibliography. More details about the project at SCORE

Detection of Inappropriate Intimacy in Software Source Code

- Developed a Java desktop tool that uses the JavaParser library to conduct static analysis and detect the Inappropriate Intimacy (two classes getting access to each other's private fields) code smell between classes in a project.

Landsat Satellite Imagery Analysis for Monitoring Vegetation Rate of the Sundarbans

- Developed a system to monitor the vegetation growth rate of the Sundarbans by analyzing satellite images

CLCDetector— A web-based cross-language code clone detector

- Created a web-based software tool that detects cross-language code clones across projects implemented in different programming languages, facilitating the identification of bugs induced by the replication of code logic

CasCADE-C — A tool for identifying casualty changes in C++ codes

- Redesigned the implementation of the CasCADE paper from our lab to detect changes in software patches for C++ code.

SCHOLARSHIPS AND AWARDS

- Received the Lambda Research Grant Award
- **NSF Travel Award (ICSE 2024)**, awarded to promising students to participate in the ICSE Student Mentoring Workshop (SMW). Received \$900 from NSF as travel funding.
- Received **Viterbi Ph.D. Fellowship, Department of Computer Science, University of Southern California (2021–2022)**, awarded for academic excellence and research potential.
- Received **Govt. Honours Scholarship – 2018**, awarded by the Government of Bangladesh to meritorious students of the University of Dhaka based on academic performance and conduct.

PROFESSIONAL MEMBERSHIPS

- Professional Member, Institute of Electrical and Electronics Engineers (IEEE)

COMPETITIVE PROGRAMMING EXPERIENCE

Contests

Represented the department in 2015 ICPC, 2016 ICPC and 2016 NCPC

Problem Solving

- UVA online judge (200+ problems)
- Codeforces (75+ problems)
- Also solved problems in: Hackerrank, Hackerearth, SPOJ, LightOJ, Leetcode