Mohammed Latif Siddiq

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GitHub | LinkedIn | Google Scholar | Researchgate

EXECUTIVE SUMMARY

- Software engineering researcher with three years of hands-on experience developing and conducting research in the intersection of software security and applied machine learning.
- Industry-level software engineering experience developing enterprise and machine learning-based software.
- **Research Interest**: Code Generation Models, Software Engineering, Software Security, and Testing.

EDUCATION

University of Notre Dame, USA January 2022 - Present
Ph.D. in Computer Science and Engineering
Advisor: Dr. Joanna C.S. Santos

University of Notre Dame, USA January 2022 - August 2024
M.S. in Computer Science and Engineering (Non-thesis)
Advisor: Dr. Joanna C.S. Santos

Bangladesh University of Engineering and Technology, Bangladesh February 2016 - February 2021
Bachelor of Science in Computer Science and Engineering
Advisor: Dr. Anindya Iqbal
Thesis: SQLIFIX: Learning Based Approach to Fix SQL Injection Vulnerabilities in Source Code

PROFESSIONAL EXPERIENCES

University of Notre Dame, IN, USA | *Graduate Assistant* January, 2022 - Present

- Working in the intersection of language models, their applications, and security.
- Published fourteen peer-reviewed research papers.

Cummins Inc., IN, USA | *Data Scientist Co-op* June, 2023 - August, 2023

- Worked on building a question-answering pipeline using large language models.
- **Tech stack**: Python, Langchain, Gradio, and Databricks platform.

REVE Systems, Dhaka, Bangladesh | *Junior Software Engineer* March, 2021 - November, 2021

- Developing enterprise software for Bangladesh Parliament Secretariat.
- **Tech stack**: Java servlet, JSP and MySQL.

PUBLICATIONS

Peer-reviewed full conference papers are prefixed with C, peer-reviewed special track papers with S, peer-reviewed workshop papers with W, and preprints with P.

⟨S3⟩ **Mohammed Latif Siddiq**. **"Advancing Secure and Standard Source Code Generation Techniques"**. 47^{th} *International Conference on Software Engineering, Doctoral Symposium (ICSE DS 2025).*

⟨C7⟩ Nishat Raihan, **Mohammed Latif Siddiq**, Joanna C. S. Santos, and Marcos Zampieri. **"Large Language Models in Computer Science Education: A Systematic Literature Review"**. 56^{th} *ACM Technical Symposium on Computer Science Education (SIGCSE TS 2025).*

⟨W4⟩ **Mohammed Latif Siddiq**, Joanna C. S. Santos, Sajith Devareddy, and Anna Muller. **"SALLM: Security Assessment of Generated Code"**. 6^{th} *International Workshop on Automated and Verifiable Software System Development (ASYDE 2024).*

⟨C6⟩ **Mohammed Latif Siddiq**, Simantika Dristi, Joy Saha, and Joanna C. S. Santos. **"The Fault in Our Stars: Quality Assessment of Prompts Used in Code Generation"**. 24^{th} *IEEE International Working Conference on Source Code Analysis and Manipulation (SCAM 2024).*

⟨C5⟩ **Mohammed Latif Siddiq**, Beatrice Casey, and Joanna C. S. Santos. **"FRANC: A Lightweight Framework for High-Quality Code Generation"**. 24^{th} *IEEE International Working Conference on Source Code Analysis and Manipulation (SCAM 2024).*

⟨C4⟩ **Mohammed Latif Siddiq**, Joanna C. S. Santos, Ridwanul Hasan Tanvir, Noshin Ulfat, Fahmid Al Rifat, and Vinicius Carvalho Lopes. **"Using Large Language Models to Generate JUnit Tests: An Empirical Study"**. 28^{th} *International Conference on Evaluation and Assessment in Software Engineering (EASE 2024).*

⟨C3⟩ **Mohammed Latif Siddiq***, Jiahao Zhang*, and Joanna C. S. Santos (*Equal contribution). **"Understanding Regular Expression Denial of Service (ReDoS): Insights from LLM-Generated Regexes and Developer Forums"**. 32^{nd} *IEEE/ACM International Conference on Program Comprehension (ICPC 2024).*

⟨S2⟩ **Mohammed Latif Siddiq**, Lindsay Roney, Jiahao Zhang, and Joanna C. S. Santos. **"Quality Assessment of ChatGPT Generated Code and their Use by Developers"**. 21^{st} *International Conference on Mining Software Repositories, Mining Challenge Track (MSR-Mining Challenge 2024).*

⟨S1⟩ **Mohammed Latif Siddiq**, Jiahao Zhang, Lindsay Roney, and Joanna C. S. Santos. **"Re(gEx|DoS)Eval: Evaluating Generated Regular Expressions and their Proneness to DoS Attacks"**. 46^{th} *International Conference on Software Engineering, New Ideas and Emerging Results Track (ICSE-NIER 2024).*

⟨P2⟩ Rishov Paul, Md. Mohib Hossain, **Mohammed Latif Siddiq**, Masum Hasan, Anindya Iqbal, Joanna C. S. Santos. **"Enhancing Automated Program Repair through Fine-tuning and Prompt Engineering"**. *arXiv preprint arXiv:2304.07840.* 2023.

⟨W3⟩ **Mohammed Latif Siddiq**, Abdus Samee, Sk Ruhul Azgor, Md. Asif Haider, Shehabul Islam Sawraz, and Joanna C. S. Santos. **"Zero-shot Prompting for Code Complexity Prediction Using GitHub Copilot"**. 2^{nd} *International Workshop on Natural Language-based Software Engineering (NLBSE 2023).*

⟨W2⟩ **Mohammed Latif Siddiq**, and Joanna C. S. Santos. **"SecurityEval Dataset: Mining Vulnerability Examples to Evaluate Machine Learning-Based Code Generation Techniques"**. 1^{st} *International Workshop on Mining Software Repositories Applications for Privacy and Security (MSR4P&S 2022).*

⟨C2⟩ **Mohammed Latif Siddiq**, Shafayat Hossain Majumder, Maisha Rahman Mim, Sourov Jajodia, and Joanna C. S. Santos. **"An Empirical Study of Code Smells in Transformer-based Code Generation Techniques"**. 22^{nd} *IEEE International Working Conference on Source Code Analysis and Manipulation (SCAM 2022).*

⟨P1⟩ Waqar Hassan Khan, Md Al Imran, Ahmed Nafis Fuad, **Mohammed Latif Siddiq**, and ABM Islam. **"Shashthosheba: Dissecting Perception of Bangladeshi People towards Telemedicine Apps through the Lens of Features of the Apps"**. *arXiv preprint arXiv:2205.02793.* 2022.

⟨W1⟩ **Mohammed Latif Siddiq**, and Joanna C. S. Santos. **"BERT-Based GitHub Issue Report Classification"**. 1^{st} *International Workshop on Natural Language-based Software Engineering (NLBSE 2022).*

⟨C1⟩ **Mohammed Latif Siddiq***, Md. Rezwanur Rahman Jahin*, Mohammad Rafid Ul Islam, Rifat Shahriyar, and Anindya Iqbal (*Equal contribution). **"SQLIFIX: Learning Based Approach to Fix SQL Injection Vulnerabilities in Source Code"**. 28^{th} *IEEE International Conference on Software Analysis, Evolution and Re-engineering (SANER 2021).*

GRANTS & SCHOLARSHIPS

Travel Grants, ACM SIGSOFT ASE 2024 Travel Awards, 2024
600$ grants to participate in ASE 2024 in-person in Sacramento, California, United States.

Travel Grants, NSF ICSE 2024 Travel Awards, 2024
1,938$ grants to participate in ICSE 2024 in-person and Student Mentoring Workshop in Lisbon, Portugal with a 30% acceptance rate.

Travel Grants, ACM SIGSOFT Travel Grants, 2023
1,200$ grants to participate in ICSE 2023 in-person and Student Mentoring Workshop in Melbourne, Australia with a 50% acceptance rate.

Travel Grants, Bangladesh Sweden Trust Fund, 2022 - 2023
100$ grants for one-way plane fare to attend USA school with financial funding.

Travel Grants, NSF ICSE 2022 Travel Awards, 2022
1,075$ grants to participate in ICSE 2022 in-person and Student Mentoring Workshop along with complimentary registration for the conference.

Research Assistantship, University of Notre Dame, 2022 - 2027
Tuition scholarship, including health insurance and bimonthly stipends.

Technical Scholarship, Bangladesh, 2016 - 2020
Complimentary government scholarship for regular engineering students.

Government Scholarship, Bangladesh, 2016 - 2020
Awarded for outstanding Performance in Higher School Certificate Examination.

Government Scholarship, Bangladesh, 2011 - 2012
Awarded for outstanding Performance in Junior School Certificate Examination.

ACHIEVEMENTS

Nominated for IBM Ph.D. Fellowship, 2024, 1 of 4 ND-CSE Ph.D. Students

Nominated for Google Ph.D. Fellowship, 2024, 1 of 4 ND-CSE Ph.D. Students

AI for Bangla, Bangladesh, 2021, Position: Top 30

Google Hashcode, Global, 2019, Position: 5^{th} Among Bangladeshi Teams

IEEEXtrme 12.0, Global, 2018, Position: 4^{th} Among Bangladeshi Teams

AUB Programming Contest, Bangladesh, 2018, Position: 11^{th}

Samsung Coding Contest, Bangladesh, 2018, 2019, Finalist

Tech for Peace Hackathon, Bangladesh, 2017, Winner

TECHNICAL SKILLS

Languages: Java, C, C++, Python, Matlab, Dart, Shell
Database: Oracle, MySQL, SQLite, MongoDB, Firebase
O.S.: Windows, Ubuntu 20.04, Windows Server 2016, Mac OS Monterey, CentOS 7/RedHat
Version Control: Git(GitHub, Bitbucket, Gitlab), TFS(Azure DevOps)
Frameworks: Vue.Js, JSP, Flutter, JavaFX, Node.js, Django, Java servlet
Web Technology: HTML, CSS, Rest API, JSON, XML
Cloud: EC2, S3 Bucket, Azure
Technical Writing: LaTeX, Beamer, Overleaf
Miscellaneous: Gradio, Langchain, Databricks, Google Apps Script, Software Defined Networking, PyTorch,

OpenGL, Weka, Mininet, NS2

CERTIFICATES

TOEFL iBT
Total: 99 (Out of 120, 30 Per section)
Reading: 24, Listening: 27, Speaking: 23, Writing: 25

LinkedIn Assessment
C, C++, Python, Django, MongoDB, MySQL, Git, HTML, Windows server, and Machine Learning

Other Certifications
Deep Learning Specialization (Coursera), Human-Computer Interaction I (Edx.org), Cyber Security Essential (CISCO Learning Platform), Problem Solving (Advanced) Skills Certification Test (Hackerrank)

Problem Solving
Codeforces (Highest Rating: 1620), Codechef (Highest Rating: 1841), Hackerrank (Highest Rating: 1780)

SERVICES

Committee Member, Artifact Evaluation Committee, The IEEE/ACM International Conference on Software Engineering (ICSE 2025).

Junior PC member, Mining Software Repositories Conference 2025 (MSR 2025).

Mentor, CSE Summer Enrichment Program, 2024.

P.C. member, Automated Software Engineering Conference 2024 Industry Showcase (ASE 2024).

Junior PC member, Mining Software Repositories Conference 2024 (MSR 2024).

Committee Member, Artifact Evaluation Committee, The ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA 2024).

Student volunteer, The IEEE/ACM International Conference on Software Engineering (ICSE 2022).

Vice President, Bangladeshi Students Association of Notre Dame (BDSA-ND) (2024 - 25).

MENTORSHIP EXPERIENCE

All mentees were supervised in conjunction with Dr. Joanna C.S. Santos (University of Notre Dame).
Women in science are marked **bold**.
* Mentees from University of Notre Dame, IN, USA.
@ Mentees from Bangladesh University of Engineering and Technology, Dhaka, Bangladesh.

Fall 2024
Antonio Karam*, Sajith Devareddy*, **Maria C. Leal***, Neol Gutierrez*, and **Noshin Ulfat**@
Summer 2024
AJ Jones*, and Vérité Mugabo*
Spring 2024
Lindsay Roney*, Sajith Devareddy*, Miguel Jose Maninang*, and Neol Gutierrez*
Fall 2023
Jiahao Zhang*, **Anna Muller***, and **Lindsay Roney***
Summer 2023
Simantika Dristi@, and Joy Saha@
Spring 2023
Abdus Samee@, Sk Ruhul Azgor@, Md. Asif Haider@, and Shehabul Islam Sawraz@
Fall 2022
Ridwanul Hasan Tanvir@, **Noshin Ulfat**@, and Fahmid Al Rifat@
Summer 2022
Shafayat Hossain Majumder@, **Maisha Rahman Mim**@, and Sourov Jajodia@
Spring 2022
Mark Cheng*

HIGHLIGHTED ACADEMIC COURSES

Graduate Course, University of Notre Dame
CSE-60770 Secure Software Engineering
CSE 60625 Advanced Machine Learning
CSE 60647 Data Science
CSE-60326 Computational Behavior Modeling
CSE-60657 Natural Language Processing
CSE-60556 Large Language Models
Undergraduate Course, Bangladesh University of Engineering and Technology
CSE-405 Computer Security
CSE-423 Fault Tolerant Systems
CSE-463 Introduction to Bioinformatics
CSE-471 Machine Learning
CSE-473 Pattern Recognition

REFERENCE

Dr. Joanna Cecilia da Silva Santos
Assistant Professor
Department of Computer Science and Engineering
University of Notre Dame, IN, USA.
Email: joannacss AT nd DOT edu
Relation: Ph.D. Advisor