

Aashish Yadavally

Ph.D. Candidate
Department of Computer Science
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Overview

I am a researcher in the field of Artificial Intelligence for Software Engineering (AI4SE, a coalescence between AI and SE), specializing in optimizing software processes. My recent work focuses on using (large) language models for understanding program behaviors, and improving software security.

Focus Areas: AI for {Program Analysis, Software Security, Software Evolution}

Education

2020 – 2025* **Doctor of Philosophy**, Computer Science

The University of Texas at Dallas

Advisor: Dr. Tien N. Nguyen

Dissertation: “Learning to Analyze Program Behaviors”

Committee: Dr. Wei Yang and Dr. Shiyi Wei (The University of Texas at Dallas)
Dr. Baishakhi Ray (Columbia University)

2018 – 2020 **Master of Science**, Artificial Intelligence

The University of Georgia

Advisor: Dr. Frederick Maier

Thesis: Machine Learning Techniques for Solar Irradiance Prediction

2014 – 2018 **Bachelor of Technology**, Computer Science

Indian Institute of Information Technology Vadodara

Advisor: Dr. Anil Vuppula

Capstone Project: “Automatic Speech Recognition using Deep Learning”

Honors & Awards

Paper Awards

2024 **ACM SIGSOFT Distinguished Paper Award** at the 31st ACM International Conference on the Foundations of Software Engineering (FSE 2024).

2023 Nomination for the **ACM SIGSOFT Distinguished Paper Award** at the 45th IEEE/ACM International Conference on Software Engineering (ICSE 2023).

2022 **IEEE TCSE Distinguished Paper Award** at the 29th IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER 2022).

Recognition

2024 **Distinguished Junior PC Reviewer Award** at the 21st International Conference on Mining Software Repositories (MSR 2024).

2021 *First Prize*, Project Dazzle, AI Camp Hackathon

2016 *First Prize in Public Voting Category*, IIITV Hackathon

Grants & Scholarships

{2024, 2023} ACM SIGSOFT CAPS Travel Award of USD 500 for FSE 2024, USD 400 for ESEC/FSE 2023, and USD 500 for ICSE 2023.

2023 NSF Student Travel Grant for MAPS Workshop 2023.

{2019 – 2020, 2018 – 2019} *Research Scholarship* including a full tuition remission, from the *Institute for Artificial Intelligence* at the University of Georgia (one of three chosen M.S. students).

Publications

(* denotes *equal contribution*, § denotes *mentorship experience*)

Published 15 peer-reviewed papers (12 full, 3 short)¹accepted at top-tier venues in software engineering (ICSE, FSE, ASE), and programming languages (OOPSLA). My work can be categorized into the following thrusts of research:

- [T1] LLMs for Reasoning on Source Code (C11, C12, C13, U2, U3)
- [T2] Artificial Intelligence for Program Analysis (C5, C6, J1, J2, U2)
- [T3] Artificial Intelligence for Software Security (C4, C7, C8, C9, C10)
- [T4] Source Code Manipulation for Software Engineering Applications (C1, C2, C3)

► Journal Papers

- [J2] [OOPSLA'24] **Aashish Yadavally**, Yi Li, Shaohua Wang and Tien N. Nguyen. 2024. A Learning-Based Approach to Static Program Slicing. In Proceedings of the 2024 ACM SIGPLAN International Conference on Object-Oriented Programming, Systems, Languages, and Applications.
- [J1] [FSE'24] **Aashish Yadavally**, Yi Li, and Tien N. Nguyen. 2024. Predictive Program Slicing via Execution Knowledge-Guided Dynamic Dependence Learning. In 31st ACM International Conference on the Foundations of Software Engineering.
★ ACM SIGSOFT Distinguished Paper Award

► Conference Papers

- [C13] [ICSE'25] **Aashish Yadavally**, Xiaokai Rong, Phat Nguyen, and Tien N. Nguyen. 2025. Large Language Models for Safe Minimization. In 47th IEEE/ACM International Conference on Software Engineering. (*To Appear*).
- [C12] [ICSE'25] Smit Patel, **Aashish Yadavally**§, Hridya Dhulipala and Tien N. Nguyen. 2024. Planning a Large Language Model for Static Detection of Runtime Errors in Code Snippets. In 47th IEEE/ACM International Conference on Software Engineering. (*To Appear*).
- [C11] [FORGE'24] Hridya Dhulipala, **Aashish Yadavally**§, and Tien N. Nguyen. 2024. Planning to Guide LLM for Code Coverage Prediction. In 1st International Conference on AI Foundation Models and Software Engineering.
- [C10] [ICSE'24] Yuchen Cai, **Aashish Yadavally**§, Abhishek Mishra, Genesis Montejo, and Tien N. Nguyen. 2024. Programming Assistant for Exception Handling with CodeBERT. In 46th IEEE/ACM International Conference on Software Engineering.
- [C9] [ICSE'24 - Poster] Yi Li, Tien N. Nguyen, Yuchen Cai, **Aashish Yadavally**, Abhishek Mishra, and Genesis Montejo. 2024. Neural Exception Handling Recommender. In 46th IEEE/ACM International Conference on Software Engineering: Posters Track.
- [C8] [ICSE'24 - Poster] Yi Li, Tien N. Nguyen, Shaohua Wang, and **Aashish Yadavally**. 2024. Poirot: Deep Learning for API Misuse Detection. In 46th IEEE/ACM International Conference on Software Engineering: Posters Track.
- [C7] [ESEC/FSE'23] Yi Li, **Aashish Yadavally**, Jiaxing Zhang, Shaohua Wang, and Tien N. Nguyen. 2023. Commit-Level, Neural Vulnerability Detection and Assessment. In 30th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering.

¹Full papers indicated with , and short papers with

- [C6] **[ESEC/FSE'23]** Yi Li, **Aashish Yadavally**, Jiaxing Zhang, Shaohua Wang, and Tien N. Nguyen. 2023. DeMinify: Neural Variable Name Recovery and Type Inference. In 30th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering.
- [C5] **[ICSE'23]** **Aashish Yadavally**, Wenbo Wang, Shaohua Wang, and Tien N. Nguyen. 2023. (Partial) Program Dependence Learning. In 45th IEEE/ACM International Conference on Software Engineering.
★ *Nomination for ACM SIGSOFT Distinguished Paper Award*
- [C4] **[ICSE'23]** Wenbo Wang, Tien N. Nguyen, Shaohua Wang, Yi Li, Jiyuan Zhang, and **Aashish Yadavally**. 2023. DeepVD: Towards Class-Separation Features for Neural Network Vulnerability Detection. In 45th IEEE/ACM International Conference on Software Engineering.
- [C3] **[ASE'22]** Hoan Anh Nguyen, Hung Phan, Samantha Syeda Khairunnesa, Son Nguyen, **Aashish Yadavally**, Shaohua Wang, Hridesh Rajan, and Tien N. Nguyen. 2022. A Hybrid Approach for Inference between Behavioral Exception API Documentation and Implementations, and Its Applications. In 37th IEEE/ACM International Conference on Automated Software Engineering.
- [C2] **[ASE'22 - NIER]** Anh Nguyen, **Aashish Yadavally**, and Tien N. Nguyen. 2022. Next Syntactic-Unit Code Completion and Applications. In 37th IEEE/ACM International Conference on Automated Software Engineering: New Ideas and Emerging Results (NIER) Track.
- [C1] **[SANER'22]** Thang V. Nguyen, **Aashish Yadavally**, and Tien N. Nguyen. 2022. Phrase2Set: Phrase-to-Set Machine Translation and Its Software Engineering Applications. In 29th IEEE International Conference on Software Analysis, Evolution and Reengineering.
★ *IEEE TCSE Distinguished Paper Award*
- **Conference Papers – Submitted, Under Review**
- [U2] **Aashish Yadavally**, Hoan Nguyen, Laurent Callot, and Gauthier Guinet. 2025. Large Language Model Critics for Execution-Free Evaluation of Code Changes.
- [U1] **Aashish Yadavally**^{*}, Xiaokai Rong^{*}, and Tien N. Nguyen. 2025. Approximate, Refine, and Analyze: Toward Comprehensive Partial Program Analysis.
- **Masters Thesis**
- Aashish Yadavally**. 2020. An Exploration of Machine Learning Based Day-Ahead Solar Irradiance Forecasting Methodologies. In University of Georgia ProQuest Dissertations Publishing.

Research Experience

- 2024 **Applied Scientist Intern, AWS AI Labs**.
Builder Tools Science / Next Gen Developer Experience
- *Hosted By:* Gauthier Guinet, Hoan A. Nguyen
 - Designed LLM-based critics for a well-structured and execution-free evaluation of complex, repository-level code changes produced by agentic workflows [U3].

- 2022 – 2024 **Graduate Research Assistant**, *The University of Texas at Dallas*.
AI for Software Engineering Advisor: Dr. Tien N. Nguyen
- Applied learning-based techniques and LLM reasoning to analyze (partial) program behaviors, with a focus on improving the security of software systems.
 - Guided junior researchers in our lab through collaborative problem solving and one-on-one mentoring sessions, offering support in navigating complex research challenges.
- 2018 – 2020 **Graduate Research Assistant**, *The University of Georgia*.
Institute for Artificial Intelligence Advisor: Dr. Frederick Maier
- *Topic*: Machine Learning Techniques for Solar Irradiance Prediction
 - Developed a predictive modeling framework for solar irradiance leveraging ~2.5TB of historical weather forecast and solar farm data from the University of Georgia.
- 2018 **Undergraduate Research Assistant**, *IIIT Hyderabad*.
Language Technologies Research Center Advisor: Dr. Anil Kumar Vuppula
- *Topic*: Automatic Speech Recognition Using Deep Learning
 - Gained expertise in designing end-to-end neural network architectures for speech tasks.

Teaching Experience

- 2024 **Graduate Teaching Assistant**, *The University of Texas at Dallas*.
- 2020 – 2022
- {Fall 2024, Spring 2021} - Automata Theory
 - {Spring 2022, Fall 2021} - Digital Logic and Computer Design
 - {Fall 2020} - Probability and Statistics in Computer Science and Software Engineering
 - {Fall 2020} - Convolutional Neural Networks
- 2021 **Associate Instructor**, *A.I. Camp*.
Courses: Natural Language Processing, Computer Vision²

Mentoring Experience

- 2024 – 2025* **Marilyn Rego**, *Purdue University*.
SIGPLAN-M Mentee
- 2024 – 2025* **Akshit Kumar**, *International Institute of Information Technology, Hyderabad*.
SIGPLAN-M Mentee
- 2023 **Abhishek Mishra**, *The University of Texas at Dallas*.
Undergraduate Student
2 co-authored papers at the International Conference on Software Engineering (ICSE'24)
- 2023 **Genesis Montejo**, *The University of Texas at Dallas*.
Undergraduate Student
2 co-authored papers at the International Conference on Software Engineering (ICSE'24)

Talks & Presentations

Invited Talks

- 06/2024 “Learning to Analyze Program Behaviors”, **Doctoral Symposium - FSE 2024**.
- 01/2024 “Contextuality of Code Representation Learning”.
Trux Open Online Seminar (TOOS), University of Luxembourg
Hosts: Prof. Dr. Jacques Klein, Prof. Dr. Tegawendé Bissyandé

Paper Presentations

- 10/2024 “A Learning-Based Approach to Static Program Slicing”, **OOPSLA 2024**.

²Average daily rating of 4.61, 4.6, and 4.81 out of 5 across three batches

- 06/2024 "Predictive Program Slicing via Execution Knowledge-Guided Dynamic Dependence Learning", **FSE 2024**.
- 01/2024 "Commit-level, Neural Vulnerability Detection and Assessment", **ESEC/FSE 2023**.
- 01/2024 "DeMinify: Neural Variable Name Recovery and Type Inference", **ESEC/FSE 2023**.
- 05/2023 "(Partial) Program Dependence Learning", **ICSE 2023**.
- 05/2023 "DeepVD: Toward Class-Separation Features for Neural Network Vulnerability Detection", **ICSE 2023**.
- 10/2022 "Next Syntactic-Unit Code Completion and Applications", **ASE 2022**.
- 03/2022 "Phrase2Set: Phrase-to-Set Machine Translation and Its Software Engineering Applications", **SANER 2022**.

Poster Presentations

- 06/2024 "Predictive Program Slicing via Execution Knowledge-Guided Dynamic Dependence Learning", **FSE 2024**.
- 05/2023 "(Partial) Program Dependence Learning", **ICSE 2023**.
- 12/2019 "Sentiment Analysis-Based Language Model Evaluation".
The Linguistics Final Project Poster Conference, University of Georgia
- 10/2019 "Solar Irradiance Prediction Using Distributed Machine Learning Techniques".
UGA Computer Science Research Day

Academic Service

- ICSE International Conference on Software Engineering.**
- 2025 - Shadow Program Committee, *Technical Track*.
 - 2024 - Program Committee, *Artifact Evaluation Track*.
- ICLR International Conference on Learning Representations.**
- 2025 - Reviewer, *Research Track*.
- EASE International Conference on Evaluation and Assessment in Software Engineering.**
- 2025 - Program Committee, *AI Models/Data Track*.
- MSR International Conference on Mining Software Repositories.**
- 2024 - Junior Program Committee, *Technical Track*.
★ Distinguished Junior PC Reviewer Award
 - 2023 - Junior Program Committee, *Technical Track*
- SIGPLAN-M Special Interest Group in Programming Languages.**
Mentor.
- TSE IEEE Transactions on Software Engineering.**
(Journal) *Reviewer.*

References

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| ○ Dr. Baishakhi Ray
<i>Associate Professor</i>
Columbia University
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<i>Principal Applied Scientist</i>
AWS AI Labs
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