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 ***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 14 peer-reviewed papers (11 full, 3 short)[1]accepted 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, U1, 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

[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.

[1]Full 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

[U3] **Aashish Yadavally**, Hoan Nguyen, Laurent Callot, and Gauthier Guinet. 2025. Large Language Model Critics for Execution-Free Evaluation of Code Changes.

[U2] **Aashish Yadavally***, Xiaokai Rong*, and Tien N. Nguyen. 2025. Approximate, Refine, and Analyze: Toward Comprehensive Partial Program Analysis.

[U1] **Aashish Yadavally**, Xiaokai Rong, Phat Nguyen, and Tien N. Nguyen. 2024. Large Language Models for Safe Minimization of Infeasible String Constraint Systems.

▶ 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 Vision[2]

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**.

[2]Average 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

ICLR 2025 **Reviewer**, *Research Track*.
International Conference on Learning Representations

ICSE 2025 **Shadow Program Committee**, *Technical Track*.
International Conference on Software Engineering

MSR 2024 **Junior Program Committee**, *Technical Track*.
International Conference on Mining Software Repositories.
★ Distinguished Junior PC Reviewer Award

ICSE 2024 **Program Committee**, *Artifact Evaluation Track*.
International Conference on Software Engineering

MSR 2023 **Junior Program Committee**, *Technical Track*.
International Conference on Mining Software Repositories.

SIGPLAN-M **Mentor**.
Special Interest Group in Programming Languages.

TSE (Journal) **Reviewer**.
IEEE Transactions on Software Engineering.

References

- **Dr. Tien N. Nguyen**
  Professor
  The University of Texas at Dallas
  `tien.n.nguyen@utdallas.edu`

- **Dr. Wei Yang**
  Associate Professor
  The University of Texas at Dallas
  `wei.yang@utdallas.edu`

- **Dr. Baishakhi Ray**
  Associate Professor
  Columbia University
  `rayb@cs.columbia.edu`

- **Dr. Omer Tripp**
  Principal Applied Scientist
  AWS AI Labs
  `omertrip@amazon.com`