Saswat PADHI

Senior SWE, Google LLC

Google TM-2, San Jose, CA
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Interest: Software infra ; building high-performance systems with strong reliability guarantees.

Employment

Google — Senior Software Engineer — Sep '22 — Present
San Jose, CA — chromeOS Performance • chromeOS
Investigating performance bottlenecks across critical user journeys on chromeOS devices.

Amazon — Applied Scientist II — Aug '20 — Sep '22
Boston, MA — Automated Reasoning Group (ARG) • Amazon Web Services (AWS)
Led the *inductive proofs* effort: mathematically proving correctness of loops in C ◆ Built and extended several compiler and verifier primitives ◆ Delivered correctness proofs for multiple AWS projects ◆ Worked with product teams to fix discovered bugs ◆ Mentored 3 PhD interns

Microsoft — Research SDE (Part-Time Contract) — Oct '17 — Aug '18
Remote — Research in Software Engineering (RiSE) • Microsoft Research (MSR)
Designed a neural approach to identify *data frames* in Excel ◆ Implemented a neural network (CNN) with near-human accuracy ◆ Prototyped a data-driven *formula recognition* feature

Education

Ph. D. Computer Science (Advisor: Prof. Todd Millstein) — Fall '14 — Spring '20
University of California, Los Angeles (UCLA) • CA, USA

B. Tech. Computer Science and Engineering (with Honors) — Fall '10 — Spring '14
Indian Institute of Technology, Bombay (IIT-B) • India

Publications

Journals & Conference Proceedings

1C • **PLDI '20** — **Data-Driven Inference of Representation Invariants.**
A Miltner, S Padhi, T Millstein, D Walker.
41st ACM SIGPLAN Conf. on Programming Language Design and Implementation Proc., pages 1 – 15.
⟪ ACM SIGPLAN Distinguished Paper Award ⟫

2C • **CAV '19** — **Overfitting in Synthesis: Theory and Practice.**
S Padhi, T Millstein, A Nori, R Sharma.
31st Intl. Conf. on Computer-Aided Verification Proc., pages 315 – 334.

3C • **CC '19** — **A Static Slicing Method for Functional Programs and Its Incremental Version.**
P Kumar, A Sanyal, A Karkare, S Padhi.
28th Intl. Conf. on Compiler Construction Proc., pages 53 – 64.

4J • **OOPSLA '18** — **FlashProfile: A Framework for Synthesizing Data Profiles.**
S Padhi, P Jain, D Perelman, O Polozov, S Gulwani, T Millstein.
Proceedings of the ACM on Programming Languages 2 (OOPSLA), 2018, pages 150:1 – 128.

5C • **PLDI '16** — **Data-Driven Precondition Inference with Learned Features.**
S Padhi, R Sharma, T Millstein.
37th ACM SIGPLAN Conf. on Programming Language Design and Implementation Proc., pages 42 – 56.

Workshops & Industrial Case Studies

6C • **NeurIPS '23** (ML4Sys) **Predicting User Experience on Laptops from Hardware Specifications.**
S Padhi, S Bhasin, U K Ammu, A Bergman, A Knies.
NeurIPS 2023 Workshop on Machine Learning for Systems.
⟪ Invited for Oral Spotlight Presentation ⟫

7C • **CAV '23** **Automated Analyses of IoT Event Monitoring Systems.**
A Apicellii, S Bayless, A Das, A Gacek, D Jaganathan, S Padhi, V Sharma, M Whalen, R Yadav.
35th Intl. Conf. on Computer-Aided Verification Proc., pages 27 – 39.

8C • **NeurIPS '20** (CAP) **OASIS: ILP-Guided Synthesis of Loop Invariants.**
S Bhatia, S Padhi, N Natarajan, R Sharma, P Jain.
NeurIPS 2020 Workshop on Computer-Assisted Programming.

Patents & Applications

9G • **Microsoft** **Record Profiling for Dataset Sampling.**
D G Simmons, K D J Grealish, S Gulwani, R Kumar, K M Ellis, S Padhi.
⟨ US 10394874 B2 ⟩

10G • **Microsoft** **Syntactic Profiling of Alphanumeric Strings.**
S Gulwani, P Jain, D A Perelman, S Padhi, O Polozov.
⟨ US 10394874 B2 • US 11210327 B2 ⟩

11A • **Microsoft** **Systems, Methods, and Computer-Readable Media for Improved Table Identification Using a Neural Network.**
B Zorn, M M J Brockschmidt, P Choudhury, O Polozov, R Singh, S Padhi.
⟨ US 20200019603 A1 ⟩

Selected Awards

UCLA Outstanding Research in CS Award — 2020
PLDI ACM SIGPLAN Distinguished Paper Award — 2020
UCLA Dissertation-Year Fellowship — 2019 – 2020
SyGuS,FLoC Invariant Synthesis (`Inv`) Competition Winner — 2017, 2018
Microsoft PhD Fellowship — 2017 – 2019

Invited Talks

NeurIPS '23 (ML4Sys) **Predicting User Experience on Laptops from Hardware Specifications.** — Dec '23
New Orleans, LA

CAV '19 **Overfitting in Synthesis: Theory and Practice.** — Jul '19
New York City, NY

OOPSLA '18 **FlashProfile: A Framework for Synthesizing Data Profiles.** — Nov '18
Boston, MA

PLDI '16 **Data-Driven Precondition Inference with Learned Features.** — Jun '16
Santa Barbara, CA

Academic Service

Program Committee PLDI ⟨2021⟩, SYNT (at CAV) ⟨2021⟩, DebugML (at ICLR) ⟨2019⟩, SyGuS-Comp ⟨2019 – 2021⟩
Invited Reviewer CAV ⟨2019⟩, ISEC ⟨2019⟩, PLDI ⟨2020⟩, TSE ⟨2021⟩
Artifact Committee OOPSLA ⟨2018, 2019⟩, POPL ⟨2020⟩, SAS ⟨2019⟩