Saswat PADHI

Senior Software Engineer, Google LLC

⦿ Google TM-2, San Jose, CA
🌐 https://saswat.padhi.me/
✉ saswatpadhi@protonmail.com
 saswatpadhi • in saswatpadhi • Ⓢ saswat.padhi

Backend generalist; building high-performance systems with strong reliability guarantees.

Employment

Google
San Jose, CA

Senior Software Engineer Sep '22 — Present
chromeOS Performance • chromeOS
- Designed an ML technique to predict performance metrics from device specifications
- Presented the prediction technology (patent pending) at NeurIPS (ML4Sys) 2023
- Currently investigating chromeOS performance bottlenecks at the browser and OS layers

Amazon
Boston, MA

Applied Scientist II Aug '20 — Sep '22
Automated Reasoning Group (ARG) • Amazon Web Services (AWS)
- Led the *inductive proofs* project: verifying correctness of C code containing loops
- Built and extended compiler and verifier primitives within the CBMC framework
- Delivered mathematical proofs of correctness and memory safety for AWS projects
- Worked with FreeRTOS, s2n, and C Commons teams to resolve discovered bugs
- Mentored 4 PhD interns; conducted 30+ interviews; created a research question bank

Microsoft
Remote

Research SDE (Part-Time Contract) Oct '17 — Aug '18
Research in Software Engineering (RiSE) • Microsoft Research (MSR)
- Designed a CNN to identify *data frames* in spreadsheets with near-human accuracy
- Deployed the data frame recognition technology (patent pending) as an Excel addon
- Prototyped *formula recognition*: identifying cells that could be replaced with formulas

Education

Ph. D. **Computer Science** Fall '14 — Spring '20
University of California, Los Angeles (UCLA) • CA, USA
- Research focus: Programming languages and software systems
- Dissertation: *Data-Driven Learning of Invariants and Specifications*
- Advisor: Prof. Todd Millstein

B. Tech. **Computer Science and Engineering** Fall '10 — Spring '14
Indian Institute of Technology, Bombay (IIT-B) • India
- Graduated with Honors
- UG Thesis: *Static Slicing of First-Order Programs using Demand Transformation*
- Advisor: Prof. Amitabha Sanyal

Publications

Journals & Conference Proceedings

1 C • **PLDI '20** **Data-Driven Inference of Representation Invariants.** 📄
A Miltner, S Padhi, T Millstein, D Walker.
⦅ ACM SIGPLAN Distinguished Paper Award ⦆

2 C • **CAV '19** **Overfitting in Synthesis: Theory and Practice.** 📄
S Padhi, T Millstein, A Nori, R Sharma.

3 C • **CC '19** **A Static Slicing Method for Functional Programs and Its Incremental Version.** 📄
P Kumar, A Sanyal, A Karkare, S Padhi.

4 J •	**OOPSLA '18**	**FlashProfile: A Framework for Synthesizing Data Profiles.** S Padhi, P Jain, D Perelman, O Polozov, S Gulwani, T Millstein.	🗎
5 C •	**PLDI '16**	**Data-Driven Precondition Inference with Learned Features.** S Padhi, R Sharma, T Millstein.	🗎

Workshops & Industrial Case Studies

6 W •	**NeurIPS '23** (ML4Sys)	**Predicting User Experience on Laptops from Hardware Specifications.** S Padhi, S Bhasin, U K Ammu, A Bergman, A Knies. ⟪ Invited for Oral Spotlight Presentation ⟫	🗎
7 C •	**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.	🗎
8 W •	**NeurIPS '20** (CAP)	**OASIS: ILP-Guided Synthesis of Loop Invariants.** S Bhatia, S Padhi, N Natarajan, R Sharma, P Jain.	🗎

Patent Grants & Applications

9 G •	**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 ⟩	🔗
10 G •	**Microsoft**	**Syntactic Profiling of Alphanumeric Strings.** S Gulwani, P Jain, D A Perelman, S Padhi, O Polozov. ⟨ US 10394874 B2, US 11210327 B2 ⟩	🔗
11 A •	**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	Predicting User Experience on Laptops from Hardware Specifications.	Dec '23
CAV '19	Overfitting in Synthesis: Theory and Practice.	Jul '19
OOPSLA '18	FlashProfile: A Framework for Synthesizing Data Profiles.	Nov '18
PLDI '16	Data-Driven Precondition Inference with Learned Features.	Jun '16

Academic Service

Program Committee	PLDI ⟨2021⟩, SYNT (at CAV) ⟨2021⟩, DebugML (at ICLR) ⟨2019⟩, SyGuS-Comp ⟨2019 – 2021⟩
Invited Reviewer	FoSSaCS ⟨2022⟩, TSE ⟨2021⟩, PLDI ⟨2020⟩, CAV ⟨2019⟩, ISEC ⟨2019⟩
Artifact Committee	OOPSLA ⟨2018, 2019⟩, POPL ⟨2020⟩, SAS ⟨2019⟩