Saswat Padhi

Senior Software Engineer, Google LLC

Google SJC-TM-2, San Jose, CA, USA
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Backend generalist; building high-performance systems with strong reliability guarantees.

Employment

Google — San Jose, CA
Senior Software Engineer — Sep '22 — Present
chromeOS Performance & Virtualization • chromeOS

- Worked on performance measurement & improvement across browser and OS layers
- Designed an ML technique to predict performance metrics from device specifications
- Presented the prediction technology (patent pending) at NeurIPS (ML4Sys) 2023

Amazon — Boston, MA
Applied Scientist II — Aug '20 — Sep '22
Automated Reasoning Group (ARG) • Amazon Web Services (AWS)

- Led the *inductive proofs* project: compiler support for certifying safety of C code with loops
- Delivered safety certificates for multiple AWS projects: FreeRTOS, s2n, and C Commons
- Collaborated with AWS IoT team on formal analysis of their events monitoring systems
- Mentored 4 PhD interns; conducted 30+ AS and SDE interviews

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 (patented) technology 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

- Specialization: Programming languages and software systems
- Dissertation: *Data-Driven Learning of Invariants and Specifications*
- Advisor: Professor 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: Professor Amitabha Sanyal

Publications

Journals & Conference Proceedings

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

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

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

4J • OOPSLA '18 **FlashProfile: A Framework for Synthesizing Data Profiles.**
S Padhi, P Jain, D Perelman, O Polozov, S Gulwani, T Millstein.

5C • PLDI '16 **Data-Driven Precondition Inference with Learned Features.**
S Padhi, R Sharma, T Millstein.

Workshops & Industrial Case Studies

6W • **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 ⟫

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.

8W • **NeurIPS '20** (CAP) **OASIS: ILP-Guided Synthesis of Loop Invariants.**
S Bhatia, S Padhi, N Natarajan, R Sharma, P Jain.

Patent Grants & Applications

9G • **Amazon** **IoT Event detector correctness verification.**
V Sharma, A Gacek, M Whalen, S Padhi, A Apicelli, R Yadav, S Bayless, R Pruzhanskiy, R Gupta, H Shah, F D Pauer, A Das, D Jaganathan.
⟨ 2024 US 12093160 B1 ⟩

10G • **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.
⟨ 2024 US 12039257 B2 ⟩

11G • **Microsoft** **Syntactic Profiling of Alphanumeric Strings.**
S Gulwani, P Jain, D A Perelman, S Padhi, O Polozov.
⟨ 2019 US 10394874 B2, 2021 US 11210327 B2 ⟩

12G • **Microsoft** **Record Profiling for Dataset Sampling.**
D G Simmons, K D J Grealish, S Gulwani, R Kumar, K M Ellis, S Padhi.
⟨ 2020 US 10846298 B2 ⟩

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
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 / Review Committee	HCVS (at ETAPS) ⟨2022, 2024⟩, PLDI ⟨2020, 2021⟩, SYNT (at CAV) ⟨2021⟩, DebugML (at ICLR) ⟨2019⟩, SyGuS-Comp ⟨2019 – 2021⟩
External Reviewer	JAIR ⟨2024⟩, FoSSaCS ⟨2022⟩, TSE ⟨2021⟩, CAV ⟨2019⟩, ISEC ⟨2019⟩
Artifact Committee	OOPSLA ⟨2018, 2019⟩, POPL ⟨2020⟩, SAS ⟨2019⟩