Saswat PADHI

Senior SWE, Google LLC

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

Interested in building reliable secure systems with strong correctness & performance guarantees.

Employment

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

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

Microsoft
Remote
Research SDE (Part-Time Contract) — Oct '17 — Aug '18
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

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Education

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

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

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 Research	PhD Fellowship	2017 — 2019

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.

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

6 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.
📄 *35th Intl. Conf. on Computer-Aided Verification Proc., pages 27 − 39.*

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

Patents Grants & Applications

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

9 G • US 10394874 B2 **Syntactic Profiling of Alphanumeric Strings.**
↗ S Gulwani, P Jain, D A Perelman, S Padhi, O Polozov.

10 A • US 20200019603 A1 **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.

Work Experience

Princeton Univ.	Verifying Data Structure Implementations	
(Visiting PhD RA)	with *Prof. David Walker*, PL Group • Princeton, NJ	Apr '19 — Jun '19
Microsoft	Mitigating Overfitting in Program Synthesis	
(PhD Intern)	with *Rahul Sharma*, Systems Group • Bengaluru, India	Sep '18 — Mar '19
Microsoft	Recovering Data Frames and Formulas in Spreadsheets	
(PhD Intern)	with *Ben Zorn*, RiSE Group • Redmond, WA	Jun '17 — Jun '18
Microsoft	Synthesizing Pattern-Based Profiles for String Datasets	
(PhD Intern)	with *Sumit Gulwani*, PROSE Group • Redmond, WA	Jun '16 — Dec '16
IIT-B	Lazy Static Slicing of Functional Programs	
(Undergrad RA)	with *Prof. Amitabha Sanyal*, Compilers Group • Mumbai, India	Sep '13 — Apr '14
Google	Automated Testing of Components in Omega Cluster Scheduler	
(Undergrad Intern)	with *Smeeta Jalan*, Technical Infrastructure Team • Mountain View, CA	May '13 — Jul '13
TU-Br	Estimating Topical Similarity of Scientific Documents	
(Undergrad Intern)	with *Prof. Wolf-Tilo Balke*, Institut für Informationssysteme • Germany	May '12 — Jul '12

Academic Service

PC Program Committee Member
PLDI ⟨2021⟩, SYNT (at CAV) ⟨2021⟩, DebugML (at ICLR) ⟨2019⟩

Reviewer External Reviewer for Research Papers
CAV ⟨2019⟩, ISEC ⟨2019⟩, PLDI ⟨2020⟩, TSE ⟨2021⟩

AEC Artifact Evaluation Committee Member
OOPSLA ⟨2018, 2019⟩, POPL ⟨2020⟩, SAS ⟨2019⟩

OC Organizing Committee Member
SyGuS-Comp ⟨since 2019⟩

Teaching

UCLA	Graduate Teaching Assistant	Spring '16 • Fall '14
	Programming Languages	
IITB	Abstractions and Paradigms in Programming	Spring '14
	Undergraduate Teaching Assistant	
IITB	Computer Programming and Utilization	Fall '13 • Fall '11
	Undergraduate Teaching Assistant	