Saswat Padhi

Applied Scientist II (ARG), AWS

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Research Interests

Programming Languages, Program Synthesis and Verification, Statistical Learning

Employment

Amazon
(Amazon Web Services) | Applied Scientist II
Proof Platforms, Automated Reasoning Group · Boston, MA | *Aug '20 — Present*

Education

2014 — 2020 | **Ph.D. (Computer Science)**
University of California, Los Angeles (UCLA) · CA, USA
Advisor: Prof. Todd Millstein

2010 — 2014 | **B. Tech. with Honors (Computer Science and Engineering)**
Indian Institute of Technology, Bombay (IIT-B) · India

Selected Awards

2020 "Outstanding Research in CS" award from UCLA (sponsored by Symantec)

2020 "ACM SIGPLAN Distinguished Paper" award at the 41st PLDI conference

2019 — 2020 Dissertation-year fellowship from UCLA

2017, 2018 Winner of the invariant inference (`Inv`) track of Syntax-Guided Synthesis Competition
(Received a FLoC Olympic Games medal at the 2018 Federated Logic Conference in UK)

2017 — 2019 PhD fellowship from Microsoft Research

Publications

Conferences and Journals

1C • **PLDI '20** — **Data-Driven Inference of Representation Invariants.**
Anders Miltner, Saswat Padhi, Todd Millstein, and David Walker.

📄 *Proceedings of the 41st ACM SIGPLAN Conference on Programming Language Design and Implementation, PLDI 2020*, pages 1–15, ACM (2020).

Artifact https://github.com/amiltner/HanoiArtifactEvaluation

2C • **CAV '19** — **Overfitting in Synthesis: Theory and Practice.**
Saswat Padhi, Todd Millstein, Aditya Nori, and Rahul Sharma.

📄 *Proceedings of the 31st International Conference on Computer-Aided Verification, CAV 2019*, pages 315–334, Springer (2019).

Artifact https://github.com/SaswatPadhi/2019_CAV_Artifact_100

3C • **CC '19** — **A Static Slicing Method for Functional Programs and Its Incremental Version.**
Prasanna Kumar K., Amitabha Sanyal, Amey Karkare, and Saswat Padhi.

📄 *Proceedings of the 28th International Conference on Compiler Construction, CC 2019*, pages 53–64, ACM (2019).

4 J • OOPSLA '18   **FlashProfile: A Framework for Synthesizing Data Profiles.**
Saswat Padhi, Prateek Jain, Daniel Perelman, Oleksandr (Alex) Polozov, Sumit Gulwani, and Todd Millstein.

📄 *Proceedings of the ACM on Programming Languages 2 (OOPSLA), 2018*, pages 150:1–128.

Artifact   https://github.com/SaswatPadhi/FlashProfileDemo

5 C • PLDI '16   **Data-Driven Precondition Inference with Learned Features.**
Saswat Padhi, Rahul Sharma, and Todd Millstein.

📄 *Proceedings of the 37th ACM SIGPLAN Conference on Programming Language Design and Implementation, PLDI 2016*, pages 42–56, ACM (2016).

Artifact   https://github.com/SaswatPadhi/LoopInvGen

Patents Grants and Applications

6 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.

7 A • US 20180121525 A1   **Syntactic Profiling of Alphanumeric Strings**.
↗ S Gulwani, P Jain, D A Perelman, S Padhi, O Polozov.

8 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 University (Visiting Student RA)	Verifying Data Structure Implementations with *Prof. David Walker*, PL Group · Princeton, NJ	*Apr '19 — Jun '19*
Microsoft (Intern)	Mitigating Overfitting in Program Synthesis with *Rahul Sharma*, Systems Group · Bengaluru, India	*Sep '18 — Mar '19*
Microsoft (Intern, Remote RSDE)	Recovering Data Frames and Formulas in Spreadsheets with *Ben Zorn*, RiSE Group · Redmond, WA	*Jun '17 — Jun '18*
Microsoft (Intern)	Synthesizing Pattern-Based Profiles for String Datasets with *Sumit Gulwani*, PROSE Group · Redmond, WA	*Jun '16 — Dec '16*
UCLA (Graduate RA)	Automated Synthesis of Specifications and Invariants with *Prof. Todd Millstein*, PL and SE Lab · Los Angeles, CA	*Sep '14 — Jun '20*
IIT Bombay (Undergraduate RA)	Lazy Static Slicing of Functional Programs with *Prof. Amitabha Sanyal*, Compilers Group · Mumbai, India	*Sep '13 — Apr '14*
Google (Intern)	Automated Testing of Components in Omega Cluster Scheduler with *Smeeta Jalan*, Technical Infrastructure Team · Mountain View, CA	*May '13 — Jul '13*
TU Braunschweig (Intern)	Estimating Topical Similarity of Scientific Documents 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⟩	

Talks and Presentations

Overfitting in Program Synthesis

Jul '19	The 2019 CAV Conference	*New York City, NY*

Synthesizing Pattern-Based Data Profiles

Dec '16	Microsoft Research	*Redmond, WA*
Oct '18	Microsoft Research	*Bengaluru, India*
Nov '18	The 2018 ACM SIGPLAN SPLASH (OOPSLA) Conference	*Boston, MA*

Data-Driven Precondition Inference

Dec '15	The 15th SoCalPLS Workshop	*Pomona, CA*
May '16	University of California at Berkeley	*Berkeley, CA*
May '16	Stanford University	*Stanford, CA*
Jun '16	The 2016 ACM SIGPLAN PLDI Conference	*Santa Barbara, CA*
Jan '17	Microsoft Research	*Bengaluru, India*

Teaching Experience

UCLA	**Programming Languages** *Graduate Teaching Assistant*	*Spring '16 · Fall '14*
IIT Bombay	**Abstractions and Paradigms in Programming** *Undergraduate Teaching Assistant*	*Spring '14*
IIT Bombay	**Computer Programming and Utilization** *Undergraduate Teaching Assistant*	*Fall '13 · Fall '11*

Mentoring Experience

Microsoft	Sahil Bhatia, *Research fellow*	*Winter '19 — Summer '19*
UCLA	Brett Chalabian, *Graduate (MS in CS)*	*Fall '17 — Winter '19*
UCLA	Zhouheng (Jeffrey) Sun, *Undergraduate (CS)*	*Fall '17 — Winter '19*
UCLA	Adam Stein, *Undergraduate (CS)*	*Fall '19 — Spring '20*