Ashish Mishra

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Personal Particulars

Postdoctoral Research Associate, Purdue University,
Computer Science Building,
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https://aegis-iisc.github.io.

Research Interests

Programming Languages, Formal Verification, Program Analysis, Program Synthesis, Type Systems, Neural + Symbolic Synthesis

Employment

Purdue University **May 2019 – Present**
Postdoctoral Research Associate,
Mentor: Suresh Jagannathan.

Northeastern University **Feb 2018 – April 2019**
Postdoctoral Research Associate,
Mentor: Frank Tip.

Education

Indian Institute of Science, Bangalore **Aug 2011 - Jan 2018**
MSc (Engineering) and PhD Computer Science, Department of CSA, IISc.
Thesis: Typestates and Beyond: Verifying Rich Behavioral Properties Over Complex Programs.
Advisor: Y. N. Srikant.

Madan Mohan Malaviya Engineering College, Gorakhpur **Aug 2006 - July 2010**
B. Tech. Computer Science, MMMEC. CGPA 74/100

Publications

[**In-preparation**] Principled Proof-search guided Component-Based synthesis for Effectful Programs.
Ashish Mishra, Suresh Jagannathan.
[**In-preparation**] Reinforcement-Learning guided Component-Based Synthesis for Model Designs for UUAVs.
Wenxian Zhang, Zikang Xiong, Ashish Mishra, Suresh Jagannathan.
[**In-submission**] Covering All the Bases: Type-based Verification of Test Input Generators.
Zhe Zhou, Ashish Mishra, Benjamin Delaware, Suresh Jagannathan.
[**In-submission**] Morpheus: Automated Type-Based Verification of Parser Combinator Programs.
Ashish Mishra, Suresh Jagannathan.
[**OOPSLA '22**] Specification-Guided Component-Based Synthesis from Effectful Libraries.
Ashish Mishra, Suresh Jagannathan.

[**Journal of Empirical Software Engineering '22**] Stubbifier: Debloating Dynamic JavaScript Applications.
Alexi Turcotte, Ellen Arteca, Ashish Mishra, Saba Alimadadi, Frank Tip.
[**ECOOP '17, Doctoral Symposium Track**] Analysis and verification of rich typestate properties for complex programs.
Ashish Mishra and Y. N. Srikant.
ECOOP 2017 Doctoral Symposium.
[**MEMOCODE '16**] Asynchrony-aware static analysis of android applications.
A. Mishra, A. Kanade, and Y. N. Srikant.
2016 ACM/IEEE International Conference on Formal Methods and Models for System Design (MEMOCODE).
[**Unpublished Manuscript**] Presburger-definable Typestates.
Ashish Mishra, Deepak D'souza, Y. N. Srikant.
arXiv:1712.08753 [cs.PL]

Professional Activities

AEC+ERC, OOPSLA '23.
Sub-Reviewer POPL '23, RTAS '15
PC Innovations in Software Engineering Conference, ISEC '23.
Workshop Proceedings Committee, ECOOP/ISSTA '18 Companion Workshops.
Student Volunteer ECOOP '2017.

Recent Talks

[**PurPL**] Specification-Guided Component-Based Synthesis from Effectful Libraries, Purdue Programming Languages Seminars, October 2022.
[**CertiK**] Specification-Guided Component-Based Synthesis from Effectful Libraries,
Virtual Talk, September 2022.
[**IIT, Ropar**] Specification-Guided Component-Based Synthesis from Effectful Libraries. Virtual Invited Talk, IIT Ropar, India, September 2022.
[**SERI**] Specification-Guided Component-Based Synthesis from Effectful Libraries, Software Engineering Research in India (SERI) 2022-23 Talk Series. August 2022.
[**Siemens**] Building Reliable Software Using PL Techniques,
Siemens Technology Labs, India. July 2022.
[**ECOOP '2017**] Analysis and verification of rich typestate properties for complex programs. ECOOP 2017 Doctoral Symposium. June 18, 2017. Barcelona, Spain, 2017.
[**MEMOCODE '16**] Asynchrony-aware static analysis of android applications. MEMOCODE 2016, IIT Kanpur, India. November 2016.
[**Poster**] Language Based Security for Smartphones, Security and Privacy Symposium, 2013, Indian Institute of Technology, Kanpur, India. 2013.

Teaching Experience

Teaching Assistant, Department of CSA, IISc
[**Course**] Programming Language Design and Implementation.

Fall 2016, Instructor : Prof Y. N. Srikant.
Topics: Foundations of programming languages, Functional programming, Type theory.
Summer School Instructor, Fourth Undergraduate Summer School, 2016, Indian Institute of Science, Bangalore, India.
[**Course**] Lambda Calculus, the core of Functional Programming Languages.

Skills

Programming
Functional : OCaml, Haskell, SML, Coq (Gallina)
Other : Java, JavaScript, C, C++, Python
Frameworks
SMT Solvers (Z3, CVC4), Node.js, Jalangi (A dynamic analysis framework for JS), Soot (A static Analysis framework for Java), LLVM.
Concepts Type-Theory, Dependent Types, Reinforcement Learning.
Languages Hindi, English.

Honors and Awards

- Awarded a full scholarship to attend *School and Workshop on Univalent Mathematics*, December 11-15, 2017, University of Birmingham, United Kingdom.
- Awarded for being in top 1% nation-wide, in CDAC *Competency in Software Technology (CST)*, exam 2010.

References

Suresh Jagannathan Professor, Department of Computer Science, Purdue University.
Email: suresh@cs.purdue.edu

Frank Tip Professor, Khoury College of Computer Sciences, Northeastern University.
Email: f.tip@northeastern.edu

William Harris Principal Scientist, Galois Inc.
Email: wrharris@galois.com

Benjamin Delaware Assistant Professor, Department of Computer Science, Purdue University.
Email: bendy@purdue.edu

Y. N. Srikant Professor(superannuated), Department of Computer Science, Indian Institute of Science.
Email: srikant@iisc.ac.in