Aaditya Naik

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Education

University of Pennsylvania
Ph. D., Computer and Information Science *Sept. 2020 – Present*

NMIMS Mukesh Patel School of Tech. Mgmt. and Engg. (MPSTME)
B. Tech., Computer Engineering *July 2016 – May 2020*

Publications

* Co-first author

Interactive Code Generation via Test-Driven User-Intent Formalization.
Shuvendu K. Lahiri*, **Aaditya Naik***, Georgios Sakkas*, Piali Choudhury, Curtis von Veh, Madanlal Musuvathi, Jeevana Priya Inala, Chenglong Wang, Jianfeng Gao
arxiv.org

Learning to Walk over Relational Graphs of Source Code.
Pardis Pashakhanloo, **Aaditya Naik**, Hanjun Dai, Petros Maniatis, Mayur Naik
Proceedings of DL4C Workshop @ ICLR '22

CodeTrek: Flexible Modeling of Code using an Extensible Relational Representation.
Pardis Pashakhanloo, **Aaditya Naik**, Yuepeng Wang, Hanjun Dai, Petros Maniatis, Mayur Naik
Proceedings of ICLR '22

Sporq: An Interactive Environment for Exploring Code Using Query-by-Example.
Aaditya Naik, Jonathan Mendelson, Nathaniel Sands, Yuepeng Wang, Mayur Naik, Mukund Ragothaman
Proceedings of UIST '21

Example-Guided Synthesis of Relational Queries.
Aalok Thakkar, **Aaditya Naik**, Nate Sands, Mukund Raghothaman, Mayur Naik, Rajeev Alur
Proceedings of PLDI '21

GenSynth: Synthesizing Datalog Programs without Language Bias.
Jonathan Mendelson*, **Aaditya Naik***, Mukund Ragothaman, Mayur Naik
Proceedings of AAAI '21

Code2Inv: A Deep Learning Framework for Program Verification.
Xujie Si*, **Aaditya Naik***, Hanjun Dai, Mayur Naik, Le Song
Proceedings of CAV '20

Work Experience

Microsoft Research
Summer Research Intern *June 2021 – September 2021*

- Formalized the problem for interactive test-driven code generation, potential solutions and workflows, and evaluated it at scale.
- Conducted comprehensive studies of its impact on the Codex model.

University of Pennsylvania
Research Intern *Jan. 2019 – May 2020*

- Worked on a project *Code2Inv* to make it compatible with various input representations including C programs and CHC constraints.
- Conducted a comprehensive study on the state-of-the-art software checkers.
- Implemented an SSA transformation for *Code2Inv* benchmarks using the *Clang C++ API*.

GetParking
Summer Intern *May 2018 – Jul. 2018*

- Used transfer learning to build a deep learning model based on the InceptionV3 architecture to identify the make and model of a car given its image.
- Thoroughly reviewed existing state-of-the-art image classification models.

Teaching Experience

University of Pennsylvania
Teaching Assistant *May 2020 – Present*

- TA for *CIS 547: Software Analysis* for Summer and Fall 2020 which covers concepts including static and dynamic analyses, symbolic executors and automated debugging.

ACM Student Chapter, MPSTME
Instructor *Sep. 2019*

- Taught core C concepts to college freshman students over a 4 day workshop.

Projects

Sporq
An interactive extension to VS Code for exploring code using query-by-example. It provides a flexible, easy-to-use and familiar interface to allow developers to conveniently synthesize custom program analyzers over their code.

GenSynth
gensynth.cis.upenn.edu
A genetic algorithm which synthesizes Datalog queries given a set of input and output data without requiring language biases.

Code2Inv
code2inv.org
A general end-to-end deep reinforcement learning framework which learns a valid loop invariant for any given verification task in a manner similar to how a human expert would learn the invariant.

Skills

Programming Languages : Python, C/C++, Bash, Java

Tools : Git, LaTeX, Docker

Miscellaneous : LLVM/Clang APIs, PyTorch, Keras, Z3

References

Mayur Naik (PhD Advisor)
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Computer and Information Science
University of Pennsylvania
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Mukund Ragothaman
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University of Southern California
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