




# Mayank Keoliya

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## EDUCATION

### University of Pennsylvania

*PhD, Computer and Information Science*

Advisors: Mayur Naik & Rajeew Alur

*Aug. 2023 – Present*

### National University of Singapore


*Bachelor's in Computer Science*

Advisor: Ilya Sergey

*Aug. 2019 – May 2023*

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## PUBLICATIONS

 Distinguished Paper

### Synthesizing Faithful Explanations for Treatment Effect Estimation

Yinjun Wu, **Mayank Keoliya**, Kan Chen, Neelay Velinger, Emily Getzen, Qi Long, Mayur Naik, Ravi Parikh

*Under submission at ICML*

### Mostly Automated Proof Repair for Verified Libraries

Kiran Gopinathan, **Mayank Keoliya**, Ilya Sergey

*PLDI '23*

### Simulating Noisy Channels for DNA Storage

**Mayank Keoliya**, Puru Sharma, and Djordje Jevdjic

*ISPASS '22*

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## WORK EXPERIENCE

### VERSE Lab, NUS

*Research Assistant*

*May 2022 – April 2023*

- Part of team that devised a novel proof repair technique which enables dynamic certification of critical systems such as financial trading and aircraft navigation
- Designed and implemented an efficient invariant synthesis algorithm
- Conducted comprehensive evaluation of our work on a diverse set of programs

### National University of Singapore

*Research Assistant*

*Aug 2021 – May 2022*

- Investigated noise in DNA sequencing, particularly with next-gen Nanopore sequencing
- Discovered key insights about the relationship between sequencing errors and molecule position within a DNA strand
- Work was published as a poster at ISPASS'22

### Garena

*Summer Intern*

*May 2021 – Aug 2021*

- Developed an alerts management system which enables teams to triage and fix errors across all of Garena's games
- Scaled the triage system to handle alerts from over 2.4 billion requests per day

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## AWARDS

- **Outstanding Undergraduate Researcher**, NUS (top 5 in a cohort of 6k) 2023
- **GIC Medal**, NUS Honors College (best computing student) 2023
- **President's Honour Roll**, NUS Honors College 2023
- **SIGPLAN-M Travel Grant** 2022

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## TEACHING EXPERIENCE

### National University of Singapore

*Teaching Assistant*

*Aug 2020 – Dec. 2020*

- TA for *CS 1101S: Intro to Programming* for a weekly tutorial of 10 students

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## PROJECTS

### CRusty

A Rust compiler plugin that facilitates migrating C code to Rust. It eliminates reference counting (i.e. runtime checks) in favour of static compile-time checks for borrowed data. Led to 30% speedup when used with common data structures such as linked lists.

### SourceC

An extension of JavaScript with undelimited and delimited continuations. It uses continuations as primitives to implement sophisticated control flows such as multi-threading, logical programming, try-catch, loops, and break/continue statements.

### Hackathon Idea-Search

*ideasearch.nushackers.org*

A semantic search tool for hackathon participants to check if their novel ideas are, indeed novel. Uses summarization LLMs to preprocess Devpost submissions from past hackathons, and embeddings to compute similarity with a given query.

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## SKILLS

**Programming Languages** : Python, OCaml, Rust, Haskell, Java

**Miscellaneous** : PyTorch, Coq, Z3, Rust compiler APIs

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## REFERENCES

**Mayur Naik** (PhD Co-Advisor)  
Professor and Graduate Chair  
Computer and Information Science  
University of Pennsylvania  
✉ mhnaik@seas.upenn.edu  
☎ 215-573-1856

**Ilya Sergey** (UG Advisor)  
Associate Professor  
School of Computing  
National University of Singapore  
✉ ilya@nus.edu.sg