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# Kiran Gopinathan

## Computer Science Researcher working on Proof Maintenance.

### Fluent in OCaml, Lean and Rocq.

## Education & Qualifications

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| *2025 Jan - Present* | Working as a Postdoctoral Researcher at the University of Illinois Urbana-Champaign under the Thomas M. Siebel Center for Computer Science. |
| *2024 August - Sept* | Awarded a Doctor of Philosophy in Computer Science from the National University of Singapore under the School of Computing Dept. |
| | Awarded the 2024 NUS' Dean's Graduate Research Excellence Award. |
| | Given to senior PhD students who have made significant advancements in their PhD study. |
| *2019 May - June* | Achieved a First Class Honours Bachelor's Degree in Computer Science from UCL |
| | Graduated from University College London |
| | Awarded Goldsmid Medal for the top graduating student of the Faculty of Engineering |
| *2016 May - June* | Achieved 4 A* A level grades in Physics, Chemistry, Further Maths and Maths |
| | Graduated from Magdalen College School |
| *2014 May - June* | Achieved A* GCSE grade in Maths, Biology, Chemistry, Physics, French, English language and literature, Geography & Art |

## Publications

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| *2025* | Y. Ling, G. Rajiv, K. Gopinathan, and I. Sergey. Sound and efficient generation of Data-Oriented exploits via programming language synthesis. In *34th USENIX Security Symposium (USENIX Security 25)*. USENIX Association, 2025 |
| *2024* | C. Le, K. Gopinathan, K. W. Lee, S. Gilbert, and I. Sergey. Concurrent data structures made easy. *OOPSLA*, 2024 |
| *2023* | K. Gopinathan, M. Keoliya, and I. Sergey. Mostly automated proof repair for verified libraries. *PLDI*, 2023 **Awarded ACM SIGPLAN Distinguished Paper Award** |
| | S. Thy, A. Costea, K. Gopinathan, and I. Sergey. Adventure of a lifetime: Extract method refactoring for rust. *OOPSLA*, 2023 |
| | M. Flatt, T. Allred, N. Angle, S. D. Gabrielle, R. B. Findler, J. Firth, K. Gopinathan, B. Greenman, S. Kasivajhula, A. Knauth, J. A. McCarthy, S. Phillips, S. Porncharoenwase, J. A. Søgaard, and S. Tobin-Hochstadt. Rhombus: A new spin on macros without all the parentheses. *OOPSLA*, 2023 |
| *2021* | Y. Watanabe, K. Gopinathan, G. Pîrlea, N. Polikarpova, and I. Sergey. Certifying the synthesis of heap-manipulating programs. (ICFP), 2021 |
| *2020* | K. Gopinathan and I. Sergey. Certifying Certainty and Uncertainty in Approximate Membership Query Structures. *CAV*, 2020 **Awarded Second Place Medal for the PLDI 2020 Student Research Competition** |
| *2019* | K. Gopinathan and I. Sergey. Towards mechanising probabilistic properties of a blockchain. *CoqPL*, 2019 |
| *2018* | K. Gopinathan, N. A. Kaloumenos, K. Ajmera, A. Matei, I. Williams, and A. Davis. FHIR FLI: an open source platform for storing, sharing and analysing lifestyle data. *ICT4AWE*, 2018 |

## Work Experience

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| *2019* | **Aetna International Research Internship,** London |

- Researched the use of Deep Learning techniques for the processing of FHIR insurance data in collaboration with the Aetna International Health Insurance company.
- As part of the internship, designed and implemented several industrial-scale machine learning pipelines, gaining experience with the processes of large scale data mining.

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| *2018* | **UCL PPLV Research Internship - Probchain,** London |

- Performed research into the mechanisation of the paper "Analysis of the Blockchain Protocol in Asynchronous Networks", the results of which were presented at the COQPL 2019 Conference.

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| *2017* | **Nuffield Health Internship,** London |

- Developed a proof of concept Alexa skill at an internship at Nuffield Health. As part of the project, gained experience in developing under the constraint of a legacy codebases.
- Over the course of the intership, became familiar with development and testing cycles.

## Honors & Awards

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| *2024* | **NUS' Dean's Graduate Research Excellence Award** |
| *2023* | **PLDI 2023 ACM SIGPLAN Distinguished Paper Award** |
| *2020* | **PLDI 2020 Student Research Competition Silver Medal** |
| *2019* | **UCL Faculty of Engineering Goldsmid Medal** |

## Mentoring, Volunteering & Event Organisation

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| *2025* | **OCaml Workshop 2025** <br> Chaired and organised the OCaml Workshop to be co-located with ICFP 2025 |
| *2022 - Present* | **SIGPLAN-M Long Term Mentoring Service** - Member of operations team. |
| *2022 - 2024* | **NUS Programming Languages & Software Engineering (PLSE) Website** <br> Developed and maintained website for NUS' PLSE groups. <br> Designed Logo for the NUS PLSE's Social Media Account. |
| *2022* | **Asean Symposium on Programming Languages and Systems** <br> Designed the badges for the artefact evaluation results. |
| *2021* | **NUS Programming Langauges Mentoring Workshop (PLMW)** <br> Served as a Panellist on the PhD Life Panel. |
| *2021* | **NUS Computing Research Week 2021** <br> Chaired and organised NUS' internal research week conference. |
| *2019* | **Symposium on Implementation and Application of Functional Languages** <br> Served as a Student Volunteer. |

## Reviewing and Program Committees

- **PC Member** - OOPSLA'26, ICFP'25, AIPLANS'21

- **External Reviewer** - ICSE'24, OOPSLA'23, POPL'22, ESOP'22, CPP'21, CPP'20

- **Artefact Evaluation Committee** - PLDI'21, ICPF'21, PLDI'20

## Teaching

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| *2023* | **CS6217: Topics in Programming Languages & Software Engineering** - Guest Lecturer <br> Gave seminar on "Program Logics for Functional Languages" <br><br> **CS5232: Formal Specification and Design Techniques** - Guest Lecturer <br> Gave seminar on Dafny and "Introduction to Floyd-Hoare Logic" |
| *2020-2023* | **CS5223: Distributed Systems** - Teaching Assistant |
| *2020-2022* | **CS4215: Programming Languages Implementation** - Teaching Assistant |
| *2021* | **CS5218: Principles and Practice of Program Analysis** - Teaching Assistant |
| *2019* | **CS1010E: Programming Methodology** - Teaching Assistant |