Rishabh Iyer

Research Interests

My current research is centered around developing systems and techniques that enable developers to reason precisely about the performance behavior of their code *before* it is deployed. My dissertation work introduced the notion of latency interfaces: simple, succinct programs that summarize a system's latency behaviour just like semantic interfaces such as code documentation and specifications summarize functionality.

Education

Ecole Polytechnique Federale de Lausanne (EPFL) *2017-2023*

Doctor of Philosophy (PhD), Computer Science
Thesis: Latency Interfaces for Systems Code
Advisors: Prof. George Candea & Prof. Katerina Argyraki

Indian Institute of Technology Bombay (IITB) *2013-2017*

Bachelor of Technology with Honours, Electrical Engineering
Thesis: Performance Modelling and Dynamic Scheduling for Heteregeneous ISA Processors
Advisor: Prof. Virendra Singh

Professional Experience

Postdoctoral Scholar at UC Berkeley *March 2024 - Present*
Supervisor: Prof. Sylvia Ratnasamy and Prof. Scott Shenker
Working on verifying performance properties of wide-area networks.

Postdoctoral Scholar at EPFL *Sep 2023 - Feb 2024*
Supervisor: Prof. George Candea
Worked on a wide range of topics centred around on building systems with predictable performance behavior

Visiting Researcher at UC Berkeley *Sep 2022 - Feb 2023*
Supervisor: Prof. Sylvia Ratnasamy
Worked on Performance Interfaces for Hardware Accelerators

Summer Intern at EPFL *May - July 2016*
Supervisor: Prof. Babak Falsafi
Ported the QFlex Trace Simulator from QEMU 2.3 to QEMU 2.6

Honors & Awards

- ACM SIGOPS Dennis M. Ritchie Doctoral Dissertation Award *2023*
- Thesis nominated by EPFL for ACM Doctoral Dissertation Award *2023*
- Best Paper Award *VDAT 2019*
- EPFL Doctoral Fellowship *2017*

Publications

- **Automatically Reasoning About How Systems Code Uses the CPU Cache**
  Rishabh Iyer, Katerina Argyraki, George Candea.
  Symposium on Operating Systems Design and Implementation (OSDI), 2024. Acceptance rate: 15.6%
- **Performance Interfaces for Hardware Accelerators**
  Jiacheng Ma, Rishabh Iyer, Sahand Kashani, Mahyar Emami, Thomas Bourgeat, George Candea.
  Symposium on Operating Systems Design and Implementation (OSDI), 2024. Acceptance rate: 15.6%
- **Achieving Microsecond-Scale Tail Latency Efficiently with Approximate Optimal Scheduling**
  Rishabh Iyer, Musa Unal, Marios Kogias, George Candea.
  Symposium on Operating Systems Principles (SOSP), 2023. Acceptance rate: 18.7%
- **The Case for Performance Interfaces for Hardware Accelerators**
  Rishabh Iyer, Jiacheng Ma, Katerina Argyraki, George Candea, Sylvia Ratnasamy.
  Hot Topics in Operating Systems (HotOS), 2023. Acceptance rate: 26.4%

- **Performance Interfaces for Network Functions**
  Rishabh Iyer, Katerina Argyraki, George Candea.
  Symposium on Networked Systems Design and Implementation (NSDI), 2022. Acceptance rate: 19.7%
- **Bypassing the Load Balancer Without Regrets.**
  Marios Kogias, Rishabh Iyer, Edouard Bugnion.
  Symposium on Cloud Computing (SoCC), 2020. Acceptance rate: 24.4%
- **Classification-Based Scheduling in Heterogeneous-ISA Architectures**
  Nirmal Boran, Dinesh Yadav, Rishabh Iyer.
  Symposium on VLSI Design and Test (VDAT), 2020. Acceptance rate: 28.7%
- **Verifying Software Network Functions with No Verification Expertise**
  Arseniy Zaostrovnykh, Solal Pirelli, Rishabh Iyer, Luis Pedrosa, Matteo Rizzo, Katerina Argyraki, George Candea.
  Symposium on Operating Systems Principles (SOSP), 2019. Acceptance rate: 13.7%
- **Performance Modelling and Dynamic Scheduling on Heterogeneous-ISA Architectures**
  Nirmal Boran, Dinesh Yadav, Rishabh Iyer
  Symposium on VLSI Design and Test (VDAT), 2019. Acceptance rate: 27.3%
  Awarded Best Paper
- **Performance Contracts for Software Network Functions**
  Rishabh Iyer, Luis Pedrosa, Arseniy Zaostrovnykh, Solal Pirelli, Katerina Argyraki, George Candea.
  Symposium on Networked Systems Design and Implementation (NSDI), 2019. Acceptance rate: 14.7%
- **Automated Synthesis of Adversarial Workloads for Network Functions**
  Luis Pedrosa, Rishabh Iyer, Arseniy Zaostrovnykh, Jonas Fietz, Katerina Argyraki.
  ACM SIGCOMM Conference (SIGCOMM), 2018. Acceptance rate: 18%

Teaching Assistantships

CS 522: Principles of Computer Systems (EPFL)	*Fall 2019, 2020, 2021, 2022*
CS 305: Software Engineering (EPFL)	*Fall 2018*
MA 207: Analysis 4 - Vector Calculus (EPFL)	*Spring 2018, 2019*
PH 107: Quantum Physics (IITB)	*Fall 2014*

Research Mentorship

- Musa Unal (PhD student at EPFL) *Summer 2022 - Present*
  Cooperative scheduling for microsecond-scale data center applications
  Second author on publication at SOSP'23.
- Jiacheng Ma (PhD student at EPFL) *Fall 2022 - Present*
  Performance Interfaces for Hardware Accelerators
  Second author on publication at HotOS'23, lead author on publication to appear at OSDI'24.
- Ayoub Chouak (summer intern at EPFL) *Summer 2021*
  Leveraging performance interfaces to identify constant-time violations in cryptographic code
  Significant contributor to publication at NSDI'22.
- Yugesh Kothari (PhD student at EPFL) *Fall 2022*
  Performance interfaces for eBPF offloads in the Linux kernel
  Significant contributor to the PIX open source tool.
- Kartikeya Kumar Dwivedi (PhD student at EPFL) *Summer 2023 - Present*
  Enabling Safe, Concurrent, and Flexible Fast-path Application Logic in the OS
- Narek Galstyan (PhD student at UC Berkeley) *Fall 2022 - Present*
  Application-integrated record and replay for distributed systems
- Rathin Singla (PhD student at UCLA) *Fall 2022 - Present*
  A verified, extensible transport stack