

Rachit Nigam

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I am a visiting scholar at MIT and PhD student at Cornell working on programming languages, compilers, and computer architecture. My research is about building and using *specialized hardware accelerators*. I have published papers at top conferences in programming languages and computer architecture and designed tools that have been adopted by researchers and practioners.

Education

Cornell University

DOCTOR OF PHILOSOPHY IN COMPUTER SCIENCE

2018 - Present

- Masters in Computer Science, 2021
- Committee: Adrian Sampson (chair), Zhiru Zhang, Nate Foster, Chris De Sa

University of Massachusetts Amherst

BACHELORS IN COMPUTER SCIENCE | SUMMA CUM LAUDE

2015 - 2018

- Thesis: *Execution Control for JavaScript*, Distinction with Highest Honors
- Committee: Arjun Guha (chair), Emery Berger

Publications

- PLDI '23** *Modular Hardware Design with Timeline Types*
Rachit Nigam, Pedro Henrique Azevedo de Amorim, Adrian Sampson
- ASPLOS '23** *Stepwise Debugging for Hardware Accelerators*
Griffin Berstein, **Rachit Nigam**, Chris Gyurgyik, Adrian Sampson
- ASPLOS '21** *A Compiler Infrastructure for Accelerator Generators*
Rachit Nigam[†], Samuel Thomas[†], Zhijing Li, Adrian Sampson († *Equal authors*)
- ASPLOS '21** *Vectorization for Digital Signal Processors via Equality Saturation*
Alexa VanHattum, **Rachit Nigam**, Vincent Lee, James Bornholt, Adrian Sampson
- PLDI '20** *Predictable Accelerator Design with Time-Sensitive Affine Types*
Rachit Nigam, Sachille Atapattu, Samuel Thomas, Theodore Bauer, Apurva Koti, Zhijing Li, Yuwei Ye, Adrian Sampson, Zhiru Zhang
- PLDI '18** *Putting in All the Stops: Execution Control for JavaScript*
Samuel Baxter, **Rachit Nigam**, Arjun Guha, Joe Gibbs Politz, Shriram Krishnamurthi

Ongoing Work

- In Preparation** *Correct-by-construction Parametric Hardware Design*
Rachit Nigam, Ethan Gabizon, Edmund Lam, Adrian Sampson
- In Preparation** *Unifying Dynamic and Static Interfaces for Accelerator Generation*
Calem Kim, Pai Li, Anshuman Mohan, Andrew Butt, Adrian Sampson, and **Rachit Nigam**
- In Preparation** *Customizing Memory Structures for High-Level Synthesis*
Andrew Butt, Matthew Hoffman, **Rachit Nigam**, Zhiru Zhang
- In Preparation** *Abstractions for User-Scheduable Languages*
Yuka Ikarashi, Samir Droubi, Kevin Qian, **Rachit Nigam**, Gilbert Louis Bernstein, and Jonathan Ragan-Kelley

Experience

Visiting Scholar, Massachusetts Institute of Technology	05/23–Now
Graduate Research Assistant, Cornell University	08/18–Now
Visiting Scholar, University of Washington	08/22–04/23
Research Intern, Facebook Reality Labs	05/19–08/19
Software Engineering Intern, Google	05/18–08/18
Research Assistant, University of Massachusetts Amherst	05/16–05/18
Visiting Researcher, Brown PLT, Brown University	05/17–08/17

Selected Awards

Distinguished Artifact Award, ASPLOS	2023
Jane Street Fellowship, Jane Street	2023
Departmental Nominee, Google Fellowship	2020
Finalist, Qualcomm Innovation Fellowship	2020
Outstanding Teaching Assistant, Cornell CIS	2019
Dean's Merit Scholarship, UMass Amherst	2018
Honors Research Fellowship, UMass Amherst	2017
Chancellor's Scholarship, UMass Amherst	2015

Academic Service

Student Research Competition Co-chair, PLDI 24	2023
External Review & Artifact Evaluation Committees, OOPSLA 23	2023
Organizer, Workshop on Languages, Tools, and Techniques for Accelerator Design	2023
Organizer, Workshop on Languages, Tools, and Techniques for Accelerator Design	2022
Organizer, Workshop on Languages, Tools, and Techniques for Accelerator Design	2021
Social Chair, PLDI 23	2022
Social Chair, PLDI 22	2021
Social Chair, PLDI 21	2021
Sub-reviewer, ISCA 21	2021
Artifact Evaluation Committee, OOPSLA 20	2020
Artifact Evaluation Committee, PLDI 20	2020
Artifact Evaluation Committee, PLDI 19	2019
Volunteer, SPLASH 18	2018

Volunteering

Founder, Programming Languages Tea	2020
Vice-President of CS Graduate Organization, Cornell CIS	2020
Organizer, CAPRA External Talk Series	2020
Organizer, Programming Languages Retreat	2019
Member of Graduate Admissions Committee, Cornell CIS	2019
Mentor, Expand Your Horizons, Cornell	2019
Mentor, Eureka! Girls Inc.	2016