

# 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

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### Cornell University

DOCTOR OF PHILOSOPHY IN COMPUTER SCIENCE

2018 - Present

- Masters in Computer Science, 2021
- Committee: Adrian Sampson, 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, Emery Berger

## Publications

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- 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**<sup>†</sup>, Samuel Thomas<sup>†</sup>, 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

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- 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*  
Caleb Kim<sup>†</sup>, Pai Li<sup>†</sup>, Anshuman Mohan, Andrew Butt, Adrian Sampson, **Rachit Nigam**    († *Equal authors*)
- 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**, Alex Reinking, Gilbert Louis Bernstein, Jonathan Ragan-Kelley

## Experience

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Visiting Scholar, Massachusetts Institute of Technology	05/23–Present
Graduate Research Assistant, Cornell University	08/18–Present
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

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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

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Student Research Competition Co-chair, PLDI	2024
External Review & Artifact Evaluation Committees, OOPSLA	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	2022
Social Chair, PLDI	2021
Social Chair, PLDI	2021
Sub-reviewer, ISCA	2021
Artifact Evaluation Committee, OOPSLA	2020
Artifact Evaluation Committee, PLDI	2020
Artifact Evaluation Committee, PLDI	2019
Volunteer, SPLASH	2018

## Other Service

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Founder, Programming Languages Tea	2020
Vice-President, Cornell CS Graduate Organization	2020
Organizer, CAPRA External Talk Series	2020
Co-founder & Organizer, Great Works in Programming Languages	2019
Organizer, Programming Languages Retreat	2019
Student Reviewer, Cornell CIS, Graduate Admissions Committee	2022
Student Reviewer, Cornell CIS, Graduate Admissions Committee	2019
Mentor, Expand Your Horizons, Cornell	2019
Mentor, Eureka! Girls Inc.	2016