# Rachit Nigam

rachit.nigam12@gmail.com | rachitnigam.com | github.com/rachitnigam

## Education

### Cornell University

Doctor of Philosophy in Computer Science — *2018 - Present*

- Research Interests: High Level Synthesis, Programming Languages
- 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

**A Synthesis-aided Compiler for DSP Architectures (WiP Paper)** — LCTES 2020
Alexa VanHattum[†], Rachit Nigam[†], Vincent Lee, James Bornholt, Adrian Sampson
In *International Conference on Languages, Compilers, and Tools for Embedded Systems*.

**Predictable Accelerator Design with Time-Sensitive Affine Types** — PLDI 2020
Rachit Nigam, Sachille Atapattu, Samuel Thomas, Theodore Bauer, Apurva Koti, Zhijing Li, Yuwei Ye, Adrian Sampson, Zhiru Zhang
In *ACM SIGPLAN Conference on Programming Language Design and Implementation*.

**Putting in All the Stops: Execution Control for JavaScript** — PLDI 2018
Samuel Baxter, Rachit Nigam, Arjun Guha, Joe Gibbs Politz, Shriram Krishnamurthi
In *ACM SIGPLAN Conference on Programming Language Design and Implementation*.

**Fission: Secure Dynamic Code-Splitting for JavaScript** — SNAPL 2017
Arjun Guha, Jean-Baptiste Jeannin, Rachit Nigam, Jane Tangen, Rian Shambaugh
In *Summit oN Advances in Programming Languages*.

## Experience

### Cornell University

Graduate Research Assistant — *08/2018 - Present*

Developed Dahlia, a High-Level Synthesis language that hardware resource constraints using affine types and region-based capabilities and improves Design Space Exploration by explicating contraints at the source level.

### Facebook Reality Labs

Research Intern — *05/2019 - 08/2019*

Applied program synthesis techniques to automatically generate correct and efficient hardware for emerging mathematical domains such as log arithmetic.

### Google

Software Engineering Intern — *05/2018 - 08/2018*

Implemented support for Progressive Web Applications for internal web application framework. Improved tooling for reporting metrics to framework users and added support for running experiments with web applications.

### University of Massachusetts Amherst

Research Assistant — *05/2016 - 05/2018*

Developed Fission, a compiler for partitioning single-tier JavaScript program while enforcing infromation flow control.

**Brown PLT, Brown University**
Visiting Researcher *05/2017 - 08/2017*
Developed Stopify, a source to source compiler for JavaScript that provides common debugging abstractions like stopping, stepping and break-pointing, in a browser based IDE for languages that compile to JavaScript.

## Awards

| | | |
|---|---|---|
| 2019 | **Outstanding Teaching Assistant** | Cornell CIS |
| 2018 | **Dean's Merit Scholarship** | UMass Amherst |
| 2017 | **Honors Research Fellowship** | UMass Amherst |
| 2017 | **Racket Summer School Scholarship** | University of Utah |
| 2017 | **CMMRS Travel Scholarship** | Max Planck Institute |
| 2016 | **Finalist, Best Project in Public Interest** | HackUMass IV |
| 2016 | **ICFP Travel Scholarship** | ICFP 16 |
| 2015 | **Chancellor's Scholarship** | UMass Amherst |

## Service

| | | |
|---|---|---|
| 2020 | **Artifact Evaluation Committee** | OOPSLA 20 |
| 2020 | **Organizer** | CAPRA External Talk Series |
| 2020 | **Artifact Evaluation Committee** | PLDI 20 |
| 2019 | **Organizer** | Programming Languages Retreat |
| 2019 | **Admissions Committee** | College of Computer Science, Cornell |
| 2019 | **Artifact Evaluation Committee** | PLDI 19 |
| 2019 | **Student Mentor** | Expand Your Horizons, Cornell |
| 2018 | **Student Volunteer** | SPLASH 18 |
| 2016 | **Student Mentor** | Eureka! Girls Inc. |

## Presentations

| | | |
|---|---|---|
| 2020 | **Predictable Accelerator Design** | University of California, Berkeley |
| 2020 | **Predictable Accelerator Design** | University of Washington |
| 2020 | **Predictable Accelerator Design** | Imperial College London |
| 2019 | **Predictable Accelerator Design** | Princeton University |
| 2017 | **Web-based Debugging for Free** | NEPLS |