Rachit Nigam

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Education

Cornell University

Doctor of Philosophy in Computer Science *2018 - Present*

- Research Interests: Programming Languages, Hardware programming

University of Massachusetts Amherst

Bachelors in Computer Science | Summa cum laude *2015 - 2018*

- Thesis: *Execution Control for JavaScript*, Distinction with Highest Honors

Publications

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

CAPRA, Cornell University

Graduate Research Assistant *08/2018 - Present*

- Developed Dhalia, 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 (log arithmetic).

Google Inc.

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.

PLASMA, University of Massachusetts Amherst

Research Assistant *05/2016 - 05/2018*

- Developed Fission, a dynamic tier splitting tool for JavaScript that allows users to write a single program for a web application, instead of two in the traditional tiered application. Implemented dynamic code splitting techniques that preserve security guarantees for private data through Information Flow Control.

- Developed a code synthesis tool for Puppet, a system configuration language, that generates edits for the program using constraints generated by user interaction in the shell. Encoded semantics of Puppet using Z3, an SMT solver, in order to generate edits.

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.

Honors & Awards

2018	**Student Volunteer**	ACM SPLASH
2018	**Dean's Merit Scholarship**	CICS, UMass Amherst
2017	**Honors Research Fellowship**	Honors College, UMass Amherst
2017	**Racket Summer School Scholarship**	University of Utah
2017	**CMMRS Travel Scholarship**	Max Planck Institute for Software Systems
2016	**Finalist, Best Project in Public Interest**	HackUMass IV
2016	**ICFP Travel Scholarship**	International Conference on Functional Programming
2015	**Chancellor's Scholarship**	University of Massachusetts Amherst