Rachit Nigam

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Education

University of Massachusetts Amherst

Bachelors in Computer Science and Mathematics | Honors Student *2015 - 2018*

- GPA: *4.00/4.00*
- Relevant Coursework: *Advanced Programming Languages (Graduate)*, *Programming Languages (Graduate)*, *Theory of Computation*, *Advanced Logic in CS (Graduate)*

Skills

- Programming Languages: *Java, JavaScript, Make, OCaml, Pyret, Python, Racket, Scala, TypeScript*
- Tools: *Docker, Z3, emacs, git, sbt, tmux, vim*
- Frameworks: *scala.js, Node.js*
- Platforms: *Debian, Mac OS, Ubuntu*
- Specialized Areas: *Compilers, Dynamic Code Analysis, Information Flow Control*

Experience

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, etc. in a browser based IDE for languages that compile to JavaScript.
- Wrote a compiler back end for the Pyret programming language and integrated it with Stopify.

PLASMA, University of Massachusetts Amherst

Research Assistant *09/2016 - Present*

- 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, a theorem prover by Microsoft, in order to generate edits.

Honors & Awards

Honors Research Fellowship

Commonwealth Honors College, UMass Amherst *01/2017*

- Recipient of honors fellowship for work on Fission, a dynamic and secure tier splitting tool for JavaScript.

MITRE Best Project in Public Interest, Overall Finalist

HackUMass IV *10/2016*

- Built a web application that analyzes a live feed and maps it to a set of possible situations. Made use of Clarifai's API to generate probabilities for image tags. Created and implemented a statistical inference algorithm to infer the situation using the probabilities for the image tags.

ICFP Travel Scholarship

Programming Languages Mentoring Workshop at ICFP 2016 *09/2016*

- Awarded scholarship by SIGPLAN to attend the Programming Languages Mentoring Workshop held at the International Conference on Functional Programming (ICFP) 2016 held in Nara, Japan.

Chancellor's Scholarship

University of Massachusetts, Amherst *09/2015*

- Received Chancellor's scholarship of the highest award value for outstanding academic achievements in high school.