

Chirag Bharadwaj

PERSONAL INFORMATION	Birthdate: 23 November 1996 Citizenship: United States	Email: chiragb@cs.princeton.edu Phone: +1 609-937-6050
LANGUAGES SPOKEN	English (native), Spanish (conversational), Mandarin (elementary)	
RESEARCH INTERESTS	programming languages, semantics, compilers, hardware accelerators, computer architecture	
EDUCATION	Princeton University , Princeton, NJ <i>Master of Science</i> , MSE, Computer Science 09/2017–06/2019 • GPA: 3.58/4.00 (expected) • Advisor: Margaret Martonosi	
	Cornell University , Ithaca, NY <i>Bachelor of Science</i> , BSc, Computer Science 08/2014–05/2017 • GPA: 3.39/4.00 • Minor: Electrical and Computer Engineering	
RESEARCH EXPERIENCE	Graduate Research Assistant , Princeton University 12/2017–09/2018 <i>Tools for Estimating the Performance of Decoupled Accelerators</i> Principal Investigator: Margaret Martonosi Estimated the performance of decoupled architectures in specialized hardware accelerators (e.g. GPUs). Used LLVM compiler pass techniques to statically analyze IR dependency graphs in this software-defined simulation. Developed cycle-accurate pre-RTL models of accelerators' computation times in both idealistic and resource-limited settings.	
	Undergraduate Research Assistant , Cornell University 01/2017–05/2017 <i>LambdaLab: Interactive λ-calculus for Learning</i> Principal Investigator: Adrian Sampson Laid out a theoretical foundation for an interactive visual tool that students could utilize to aid in learning the lambda calculus. Considered pedagogical value for multiple-intelligence learners.	
	<i>Investigating Behavioral Equivalence in Intermediate Representations</i> 08/2016–12/2016 Principal Investigator: Adrian Sampson Generated CPU-like LLVM IR equivalent in behavior to complex NVIDIA CUDA programs. Worked towards an high-level GPU synthesis tool for simplified RTL in a heterogeneous architecture.	
TEACHING EXPERIENCE	Graduate Teaching Assistant , Princeton University 09/2017– • ELE 206: Digital Logic Design • ELE 375: Computer Organization and Architecture • COS 326: Functional Programming	
	Undergraduate Teaching Assistant , Cornell University 01/2015–05/2017 • CS 3410: Digital Logic and Computer Organization (head TA) • CS 3110: Functional Programming and Data Structures (head TA) • CS 2800: Discrete Mathematics and Structures	
PUBLICATIONS	Theses • C Bharadwaj. <i>LambdaLab: Interactive λ-calculus for Learning</i> . Cornell University, May 2017.	
	Unpublished Works • C Bharadwaj, SD Goré. <i>Reddit Comments via Generative Grammar Modelling</i> , May 2017. • SK Somayyajula, C Bharadwaj. <i>Refined Logic: Implementing Constructive Logics</i> , Dec. 2016.	

TALKS	Princeton University	
	<ul style="list-style-type: none"> • <i>Special Topics: Laguerre Polynomials</i>, mathematics seminar, Apr. 2018. 	
	Cornell University	
	<ul style="list-style-type: none"> • <i>Handy Techniques for Empirical Analysis</i>, mathematics seminar, Apr. 2017. • <i>Musical Groups: Exploring Music with Math</i>, music seminar, Nov. 2016. • <i>Special Topics: Legendre Polynomials</i>, mathematics seminar, Apr. 2016. • <i>A Survey of Japanese Linguistics</i>, linguistics seminar, Oct. 2015. • <i>A Treatise on Complex Analysis</i>, mathematics seminar, Apr. 2015. 	
SCHOLARSHIPS AND AWARDS	Princeton University	
	<ul style="list-style-type: none"> • Teaching assistantship for engineering graduate study 	09/2017–
	Cornell University	
	<ul style="list-style-type: none"> • Outstanding teaching assistant in Computer Science 	05/2016, 05/2017
	<ul style="list-style-type: none"> • Best final project (PokéSnowdown) in CS 3110 	12/2015
	<ul style="list-style-type: none"> • Dean’s List in the College of Engineering 	12/2014
	Earlier Honors	
	<ul style="list-style-type: none"> • Outstanding achievement in chemistry (2/747) 	06/2014
	<ul style="list-style-type: none"> • NJ VEX robotics semifinalist team: 750-R 	02/2014
	<ul style="list-style-type: none"> • National Merit Finalist (1 of 15000) 	01/2014
PROJECTS	<ul style="list-style-type: none"> • National AP Scholar (score of 4 or higher on eight AP exams) 	05/2013
	<ul style="list-style-type: none"> • ASCAP Morton Gould Young Composer Honorable Mention (U18 category) 	04/2012
	Research Projects	
	<ul style="list-style-type: none"> • pythia: A static pre-RTL tool for performance estimation in hardware accelerators 	07/2018
	<ul style="list-style-type: none"> • refinery: A realization of various refinement logics in OCaml 	12/2016
	Software and Implementations	
	<ul style="list-style-type: none"> • redditcommentor: Using generative grammars to model Reddit comments 	05/2017
	<ul style="list-style-type: none"> • PokéSnowdown: A winter-themed single-player spin-off of Pokémon Showdown 	12/2015
	Notes and Sketches	
	<ul style="list-style-type: none"> • Modern Linguistics: A comprehensive treatment of theoretical/applied linguistics 	on hiatus
SERVICE AND OUTREACH	<ul style="list-style-type: none"> • Cornell Course Notes: A digitization project of notes taken from Cornell courses 	on hiatus
	<ul style="list-style-type: none"> • Calculus Done Right: A self-teaching approach to learning AP Calculus 	01/2011
	Princeton University	
	<ul style="list-style-type: none"> • Graduate Engineering Council communications director 	09/2018–
	<ul style="list-style-type: none"> • Political Engagement Initiative for Asian-American students 	10/2017–
	<ul style="list-style-type: none"> • Graduate Engineering Council department representative 	09/2017–05/2018
	Cornell University	
	<ul style="list-style-type: none"> • Co-mentor for URM and women in Computer Science 	01/2017–05/2017
	<ul style="list-style-type: none"> • Mentor for underclassmen in Computer Science 	08/2016–12/2016
	<ul style="list-style-type: none"> • Freshman orientation leader (group leader) 	08/2015, 08/2016
	<ul style="list-style-type: none"> • Engineering freshman peer advisor (lead advisor) 	08/2015–05/2017
	<ul style="list-style-type: none"> • Volunteer piano instructor for adult beginners in local community 	08/2015–05/2017
	<ul style="list-style-type: none"> • NY Science Olympiad invitational organizer and event moderator 	09/2014–02/2017
	Earlier Volunteering Efforts	
	<ul style="list-style-type: none"> • Volunteer AP calculus teaching assistant in Monmouth Junction, NJ 	09/2010–05/2014
	<ul style="list-style-type: none"> • High school badminton tournament co-organizer 	04/2012–04/2014

SKILLS

Programming and Scripting

- Java, Kotlin, C, C++, OCaml, Python, Ruby, `bash`, `awk`, `sed`

Verification and Solvers

- Coq, NuPRL, SystemVerilog

Web Development

- HTML5, CSS/SASS, JavaScript, Dropwizard, JDBC, SQL, Guice, Jekyll, Ruhoh, Nanoc

Hardware, Assembly, and ISAs

- CUDA, LLVM, ARM, MIPS, RISC-V, LC-3, Verilog, GTKWave, ModelSim, Quartus, SPICE

Tools and Libraries

- \LaTeX , Markdown, CMake, Makefile, Maven, Gradle, Eclipse, IntelliJ, `vim`, `git`, `svn`, `hg`, `gdb`, `valgrind`, `gprof`, `lex/yacc`, `flex/bison`

SELECTED COURSEWORK

Princeton University

- COS 320: Compiling Techniques
- COS 521: Advanced Algorithms
- COS 533: Advanced Cryptography
- COS 597E: Advanced NLP Techniques*
- ELE 575: Advanced Computer Architecture
- MAT 313: Category Theory for Scientists*

Cornell University

- CS 2043: UNIX and Scripting Tools
- CS 2112: Honors Data Structures and OOP
- CS 2800: Discrete Structures
- CS 3110: Functional Programming
- CS 3410: Computer Organization
- CS 4410: Operating Systems
- CS 4700: Artificial Intelligence
- CS 4750: Mathematical Robotics
- CS 4780: Machine Learning
- CS 4810: Theory of Computation
- CS 4820: Analysis of Algorithms
- CS 4860: Applied Logic
- CS 6110: Advanced Programming Languages
- CS 6810: Advanced Theory of Computation
- ECE 2100: Electrical Circuits
- ECE 2300: Digital Logic Design
- ECE 3140: Embedded Systems
- ECE 3150: Microelectronics
- ECE 4130: Nuclear Science and Engineering
- LING 1101: Introduction to Linguistics