Chirag Bharadwaj

Personal Information	**Birthdate:** 23 November 1996	**Email:** chiragb@cs.princeton.edu
	Citizenship: United States	**Phone:** +1 609-937-6050

Languages Spoken

English (native), Kannada (bilingual), Spanish (conversational)

Research Interests

computer architecture, microarchitectural models, heterogeneous ISAs, approximate computing

Education

Princeton University, Princeton, NJ

Master of Science, MSE, Computer Science — expected 06/2019
- GPA: 3.30/4.00
- Advisor: Margaret Martonosi

Cornell University, Ithaca, NY

Bachelor of Science, BSc, Computer Science — 05/2017
- GPA: 3.39/4.00
- Minor: Electrical and Computer Engineering

Research Experience

Graduate Research Assistant, Princeton University

Tools for Estimating the Performance of Decoupled Accelerators — 01/2018–

Principal Investigator: Margaret Martonosi

Estimating the performance of decoupled architectures in hardware accelerators. Using LLVM pass techniques on data-flow and control-flow graphs to create cycle-time constraints for programs. Creating cache-latency-precise models of accelerators' computation times via constraint collection.

Undergraduate Research Assistant, Cornell University

LambdaLab: Interactive λ-calculus for Learning — 01/2017–05/2017

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.

Behaviorally-equivalent Intermediate Representation Generation — 08/2016–12/2016

Principal Investigator: Adrian Sampson

Generated LLVM IRs equivalent in behavior to complex NVIDIA CUDA programs for GPUs. These IRs were to be used to create a microarchitecture that achieves better CPU/GPU separation.

Teaching Experience

Graduate Teaching Assistant, Princeton University — 09/2017–
- ELE 206: Digital Logic Design
- ELE 375: Computer Organization and Architecture

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 Structures

Publications

Theses
- **C Bharadwaj**. *LambdaLab: Interactive λ-calculus for Learning*. Cornell University, May 2017.

Unpublished Works
- **C Bharadwaj**, SD Goré. *Reddit Comments via Generative Grammar Modelling*, May 2017.
- SK Somayyajula, **C Bharadwaj**. *Refined Logic: Implementing Constructive Logics*, Dec. 2016.

TALKS	**Princeton University**	
	• *Special Topics: Laguerre Polynomials*, mathematics seminar, Apr. 2018.	

Cornell University
- *Handy Techniques for Empirical Analysis*, mathematics seminar, Apr. 2017.
- *Musical Groups: Exploring Music with Math*, music seminar, Nov. 2016.
- *Special Topics: Legendre Polynomials*, mathematics seminar, Apr. 2016.
- *A Survey of Japanese Linguistics*, linguistics seminar, Oct. 2015.
- *A Treatise on Complex Analysis*, mathematics seminar, Apr. 2015.

SCHOLARSHIPS AND AWARDS

Princeton University

• Teaching assistantship for engineering graduate study	09/2017–06/2019

Cornell University

• Outstanding teaching assistant in Computer Science	05/2016, 05/2017
• PokéSnowdown: Best final project in CS 3110	12/2015
• Dean's List in the College of Engineering	12/2014

Earlier Honors

• Outstanding achievement in chemistry (2/747)	06/2014
• NJ VEX robotics semifinalist team: 750-R	02/2014
• National Merit Finalist (1 of 15000)	01/2014
• National AP Scholar (score of 4 or higher on eight AP exams)	05/2013
• Morton Gould Young Composer Award, honorable mention for ages 12-18	04/2012

PROJECTS

Software and Implementations

• `redditcommentor`: Using generative grammars to model Reddit comments	05/2017
• `refined-logic`: Implementing refinement logics in OCaml	12/2016
• PokéSnowdown: A winter-themed single-player spin-off of Pokémon Showdown	12/2015

Notes and Sketches

• Modern Linguistics: A comprehensive treatment of theoretical/applied linguistics	in progress
• Cornell Course Notes: A digitization project of notes taken from Cornell courses	on hiatus
• Calculus Done Right: A self-teaching approach to learning AP Calculus	01/2011

SERVICE AND OUTREACH

Princeton University

• Political Engagement Initiative for Asian-American students	10/2017–
• Computer Science dept. representative in Graduate Engineering Council	09/2017–

Cornell University

• Co-mentor for URMs and women in Computer Science	01/2017–05/2017
• Mentor for underclassmen in Computer Science	08/2016–12/2016
• Freshman orientation leader (group leader)	08/2015, 08/2016
• Engineering freshman peer advisor (lead advisor)	08/2015–05/2017
• Volunteer piano instructor for adult beginners	08/2015–05/2017
• NY Science Olympiad invitational organizer and event moderator	09/2014–02/2017

Earlier Volunteering Efforts

• Volunteer AP calculus teaching assistant in Monmouth Junction, NJ	09/2010–05/2014
• High school badminton tournament co-organizer	04/2012–04/2014

Programming and Scripting
- Java, Kotlin, C, C++, OCaml, Coq, Python, Ruby, `bash`, `awk`, `sed`

Hardware and Software Verification
- Coq, Agda, 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, Makefile, Maven, Gradle, Eclipse, IntelliJ, `vim`, `git`, `svn`, `gdb`, `valgrind`, `gprof`, `lex`/`yacc`, `flex`/`bison`

Princeton University
- COS 320: Compiling Techniques*
- COS 521: Advanced Algorithms
- COS 533: Advanced Cryptography
- ELE 575: Advanced Computer Architecture*

* = currently enrolled

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: Microlectronics
- ECE 4130: Nuclear Science and Engineering
- LING 1101: Introduction to Linguistics