

# Aviral Goel

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## EDUCATION

**PHD IN COMPUTER SCIENCE**  
**NORTHEASTERN UNIVERSITY**  
Boston, MA | 2017 - 2022 (Expected)  
GPA: 4.0/4.0

### Courses

- Computer Systems
- Intensive Principles of Programming Languages
- Program Analysis Seminar
- Theory of Computation

**MS IN COMPUTER SCIENCE**  
**NORTHEASTERN UNIVERSITY**  
Boston, MA | 2016 - 2017  
GPA: 4.0/4.0

### Courses

- Program Design Paradigms
- Programming Languages
- Advanced Program Analysis
- Programming Models for Distributed Computing

**BE IN ELECTRONICS AND COMMUNICATION ENGINEERING**  
**NETAJI SUBHAS INSTITUTE OF TECHNOLOGY**  
New Delhi, India | 2008 - 2012

Aggregate: 81.56%  
First Class with Distinction

### Courses

- C Programming
- Numerical Methods
- Computer Systems Organization
- Systems Programming
- Microprocessors
- Digital Circuits and Systems
- Data Structures and Algorithms

## TECHNICAL SKILLS

- C++
- C
- R
- Python
- Racket
- SQL
- Javascript
- Linux
- Git

## RESEARCH EXPERIENCE

### ANNOTATIONS FOR R

Jun 2016 – Present

- Modified the official GNU R implementation to add support for annotations on functions and a mechanism to process them and rewrite R code.
- Designed an R library to insert function parameter and return type contracts for annotated functions.

### STUDY OF LAZINESS IN R

July 2017 – Present

- Dynamically analyzed R code to understand how laziness is used and its interaction with metaprogramming and other dynamic features of R.
- Developed a dynamic analysis framework; instrumented the R interpreter and developed a data analysis pipeline to efficiently compress, store, aggregate and visualize runtime events.

## TEACHING EXPERIENCE

### TEACHING ASSISTANT

- Intensive Principles of Programming Languages (PhD) Sep – Dec 2018
- Large-Scale Parallel Data Processing (MS) Sep – Dec 2017
- Introduction to Programming for Data Science (MS) Jan – Apr 2017
- Algorithms and Data (BS) May – Aug 2016

## INDUSTRY EXPERIENCE

### TECHNOLOGY MANAGER

Feb 2015 – Dec 2015

**INSTITUTE FOR STEM CELL BIOLOGY AND REGENERATIVE MEDICINE, DBT**  
Bengaluru, India

- Integrated a 3D neuronal network visualizer (Moogli) to a neuronal network simulator MOOSE (Multiscale Object Oriented Simulation Environment).
- Added support for loading and visualizing neuronal models in real time from user defined simulation workflows in MOOSE.

### PROGRAMMER

Sep 2013 – Feb 2015

**NATIONAL CENTER FOR BIOLOGICAL SCIENCES**

Bengaluru, India

- Designed a C++ 3D graphics software, *Moogli*, for visualizing electrical and chemical activity data from neuronal network simulations.
- The software was used by a PhD student for visualizing a model of the Rat brain's Olfactory bulb.

### SOFTWARE ENGINEER

Jul 2012 – Aug 2013

**YAHOO!**

Bengaluru, India

- Designed a data analytics dashboard for visualizing product usage trends with periodic report generation capabilities for better marketing and development decisions.
- Aggregated product usage statistics from big data sets on Hadoop cluster using Apache Pig.

### INTERN

Jun 2010 – Jul 2010

**SIEMENS LIMITED**

New Delhi, India

- Designed a version management program for a distributed power plant automation and management system.

## PUBLICATIONS & POSTERS

- **CORRECTNESS OF SPECULATIVE OPTIMIZATIONS WITH DYNAMIC DEOPTIMIZATION**  
*Olivier Flückiger et al.* POPL 2018
- **MODELLING MEMORY ACROSS SCALES**  
*Subhasis Ray et al.* Poster presented at Annual Talks 2015 NCBS, Bengaluru, India
- **MODELLING MOLECULES TO BRAINS WITH MOOSE**  
*Aviral Goel et al.* Poster presented at Annual Talks 2014 NCBS, Bengaluru, India