Aviral Goel

917.443.0228
goel.aviral@gmail.com
aviralg
aviralgoel

EDUCATION

NORTHEASTERN UNIVERSITY
MS in Computer Science
Boston, MA | 2016 - 2017 (Expected)
GPA: 4.0/4.0

NETAJI SUBHAS INSTITUTE OF TECHNOLOGY
B.E. in Electronics and Communication Engineering
New Delhi, India | 2008 - 2012
First Class with Distinction
Aggregate : 81.56%

COURSEWORK

GRADUATE
CS5010 - Program Design Paradigms
CS5400 - Programming Languages
CS7480 - Advanced Program Analysis
CS7680 - Programming Models for Distributed Computing

UNDERGRADUATE
EC210 - C Programming
EC222 - Numerical Methods
EC303 - Computer Systems Organization
EC309 - Systems Programming
EC311 - Microprocessors
EC402 - Digital Circuits and Systems
EC410 - Data Structures and Algorithms

TECHNICAL SKILLS

PROGRAMMING LANGUAGES
Python • C • C++ • Java
Racket • Haskell

SCIENTIFIC COMPUTING
Mathematica • Matlab

WEB TECHNOLOGIES
HTML • CSS • PHP • Javascript
Node.js • Bootstrap • jQuery
Backbone.js • Underscore.js
Three.js • YUI

FRAMEWORKS
Qt • PyQt • OpenSceneGraph

HOBBIES

Origami • Violin

WORK EXPERIENCE

TEACHING ASSISTANT for CS4800 - ALGORITHMS and DATA
Northeastern University
Boston, Massachusetts | May 2016 – Aug 2016
- Helped students with the course content and assignments.
- Graded assignments and provided feedback for improvement.

TECHNOLOGY MANAGER
Institute for Stem Cell Biology and Regenerative Medicine, DBT
Bengaluru, Karnataka, India | Feb 2015 – Dec 2015
- Extended 3D visualizer(moogli) for neuronal network simulations with support for describing simulation workflows.
- Worked on better and faster rendering of neuronal models.
- Improved graphing capabilities by providing more plotting options.
- Improved integration with the simulator(MOOSE) and created a set of illustrative examples.

PROGRAMMER
National Center for Biological Sciences, TIFR
Bengaluru, Karnataka, India | Sep 2013 – Feb 2015
- Designed a 3D graphics software, moogli, for visualizing electrical and chemical activity in neuronal network simulations. The software is written in C++ with Python bindings using a 3D scene graph library.
- Implemented support for loading and visualizing models from the corresponding neuronal network simulator, MOOSE(Multiscale Object Oriented Simulation Environment).
- The software was used by a PhD student for visualizing a model of the Rat brain's Olfactory bulb for his PhD thesis defence.

SOFTWARE ENGINEER
Yahoo! Software Development India Private Limited
Bengaluru, Karnataka, India | July 2012 – Aug 2013
- Designed a data analytics dashboard for aggregating and visualizing product usage trends with automatic updates and reporting capabilities.
- Aggregated statistics from big data sets on Hadoop cluster using Apache Pig.

INTERN
Royal Bank of Scotland
Gurgaon, Haryana, India | June 2011 – July 2011
- Studied the design of a FIX (protocol for financial transactions) engine, Banzai, written in Java.

INTERN
Siemens Limited
New Delhi, India | June 2010 – July 2010
- Designed a version management program for a power plant automation and management software installed on multiple nodes in the network.

ACADEMIC PROJECTS

IMPLEMENTING A TYPE SYSTEM FOR R
Northeastern University, CCIS
June 2016 – Present | Boston, Massachusetts
Working with Prof. Jan Vitek and Benjamin Chung to implement type annotation support in the GNU R interpreter. The annotations serve as an expressive language construct, enhancing the metaprogramming capabilities of the language. This will enable us to experiment with gradual typing in R.

STRICTNESS ANALYSIS FOR R
Northeastern University, CCIS
September 2016 – Present | Boston, Massachusetts
Working with Prof. Jan Vitek and Prof. Frank Tip to develop an interprocedural dataflow algorithm for R to remove inefficiencies arising due to R's call by need evaluation strategy. This should help improve performance and reduce memory consumption.

POSTERS

MODELLING MEMORY ACROSS SCALES
NCBS, TIFR, Bengaluru, India | Annual Talks 2015
Subhasis Ray, Harsha Rani, Aditya Gilra, Sahil Moza, Aviral Goel, Dilawar Singh, Upinder Bhalla

- Described the capabilities of MOOSE(Multiscale Object Oriented Simulation Environment), a simulator which can simulate neuronal network activity at both electrical and chemical levels.
- Presented the PhD projects of several students which relied on its electrical and chemical computation capabilities.

MODELLING MOLECULES TO BRAINS WITH MOOSE
NCBS, TIFR, Bengaluru, India | Annual Talks 2014
Aviral Goel, Harsha Rani, Dilawar Singh, Subhasis Ray, Niraj Dudani, Upinder Bhalla

- Presented the architecture of MOOSE, a neuronal network simulator. Illustrated its chemical and electrical components and how they interact with its numerical solvers.
- Discussed standard file formats supported for exchanging neuronal network model information.
- Described future directions and improvements.

PUBLICATIONS

[1] N. Baharadwaj, S. Wadhwa, P. Goel, I. Sethi, C. S. Arora, A. Goel, S. Bhatnagar, and H. Parthasarathy. De-noising, clustering, classification, and representation of microarray data for disease diagnostics. In R. Srivastava, S. K. Singh, and K. K. Shukla, editors, *Research Developments in Computer Vision and Image Processing: Methodologies and Applications*, chapter 9, pages 149–174. IGI Global, September 2013.

REFERENCES

Available upon request