Prashant Vaidyanathan

Boston University
Department of Electrical and Computer Engineering
8 Saint Mary's Street
Boston, MA 02215 USA

617-817-0855 (Phone)
prashATbuDOTedu
https://github.com/PrashantVaidyanathan
http://prashantvaidyanathan.github.io
https://scholar.google.com/citations?user=KcqfmtMAAAAJ

Education

- **Boston University** — Boston, Massachusetts USA
  Ph.D., Computer Engineering — *9/14 - Present*
  - **Dissertation**: "Functional Mapping of Genetic Systems"
  - **Advisor**: Prof. Douglas Densmore
  - **Thesis Committee**: Prof. Calin Belta (SE), Prof. Wenchao Li (ECE), and Andrew Phillips (Microsoft Research)
  - **Projected Graduation Year**: 2018
- **Boston University** — Boston, Massachusetts USA
  M.S., Computer Engineering — *9/12 - 1/14*
  - **Thesis**: "Implementation, Benchmarking, And Evaluation of FPGA Multipliers"
  - **Thesis Advisor**: Prof. Douglas Densmore
- **Birla Institute of Technology and Science - Pilani** — Dubai, UAE
  B.E., Electronics and Electrical Engineering — *8/08 - 8/12*

Academic Experience

- **CIDAR Lab - Boston University** — Boston, Massachusetts USA
  Graduate Research Assistant — *11/12 - Present*
  - Project Lead for 5 research projects funded by 2 NSF grants which include Cello: A synthesis tool for Boolean logic genetic circuits and Phoenix: A design automation tool to build robust genetic circuits with temporal verification
  - Mentored 2 undergraduate research projects funded by NSF and Boston University's UROP program
- *System Administrator*
  - *Set up AWS EC-2 servers and migrated all lab tools to the cloud*
  - *Managed and maintained Lab Servers and accounts including Github, AWS and Google Analytics*
- ***NONA Research Foundation*** — *Boston, Massachusetts USA*
  Technical Advisor and Development Support — *6/16 - Present*
  - *Helped set up software infrastructure to manage and use open-source software and tools in the fields of synthetic biology and bio-design automation*

Industry Experience

- **Microsoft Research** — Cambridge, UK
  Research Intern — *6/17 - 9/17*
  - Created an F# implementation for the Synthetic Biology Open Langugage (SBOL) data structure
  - Working with the Biological Computation Group on various projects related to the design and synthesis of genetic circuits
- **Boston University - Information Services & Technology** — Boston, Massachusetts USA
  Assistant Computer Programmer — *9/12 - 1/14*
  - Performed regression and load testing for various software tools used by Boston University
  - Evaluated software solutions and automated tests for regression test plans

- **Microsoft (Gulf) - Developer Platform Technologies Department** Dubai, UAE
  Junior Software Developer *2/12 - 7/12*
  - Created Windows Phone 7 Apps for the Gulf region and developed internal software tools and Apps for the Microsoft Gulf Team
  - Worked on Internal Microsoft Gulf projects and created several Apps for various teams
  - Created Proof of Concept Windows Phone 7 Apps for several companies based in Dubai to promote the use of Microsoft Technologies in those companies
  - Worked on some of the first Windows 8 Apps to be built for the Gulf Region
  - Conducted 20+ workshops as a guest lecturer in 4 universities, teaching students the basics of Object Oriented Programming and how to make Windows Phone Apps and XNA games
  - Organized "Hackathons" for student developers helping them build and compete in competitions for Windows Phone 7 App development
- **Aptec - Middle East** Dubai, UAE
  Marketing Intern *6/10 - 7/10*
  - Marketed for IBM server among local Small and Medium Business Ventures
- **Larsen & Toubro - EBG Department** Mumbai, Maharashtra India
  Research & Development Intern *6/09 - 8/09*
  - Conducted timing tests & calculation of Response time of Numerical relays connected in a Daisy chain connection to a Data concentrator using Modscan software
  - Created sample HMI project for all types of P&B relays
  - Designed the System Architecture drawings in AutoCad for a system integration project
  - Interfaced tests on IEC 61850 protocol in Numerical Protection relays
  - Tabulated memory maps for a system integration project with excel macros for error check in memory maps

Awards and Fellowships

- *BBF Scholar Travel Award*, **BioBricks Foundation**, 2017
- *Distinguished Electrical and Computer Engineering Fellowship*, **Boston University**, 2014
- *Award for Science and Technology Transfer*, **World Association for Innovative Technologies**, 2011

Grants

1. *AWS Cloud Credits for Research*, **Amazon Web Services**, $10,000, 8/16-8/17
2. *AWS Research Grant*, **Amazon Web Services**, $12,000, 9/15-9/16

Publications

h-index = 3, total citations = 206 (Google Scholar, 13^{th} May 2018)

Journal Articles

1. Göksel Misirli, Tramy Nguyen, James Alastair McLaughlin, **Prashant Vaidyanathan**, Timmothy Jones, Douglas Densmore, Chris Myers, Anil Wipat, *A computational workflow for the automated generation of models of genetic designs.* ACS Synthetic Biology, 2018.

2. Alec Nielsen, Bryan Der, Jonghyeon Shin, **Prashant Vaidyanathan**, Vanya Paralanov, Elizabeth Strychalski, David Ross, Douglas Densmore, and Christopher A. Voigt, *Genetic Circuit Design Automation*, Science, vol. 352, iss. 6281, 2016. **PMID: 27034378**

3. **Prashant Vaidyanathan**, Bryan Der, Swapnil Bhatia, Nicolas Roehner, Ryan Silva, Christopher A. Voigt, and Douglas Densmore, *A Framework for Genetic Logic Synthesis*, Proceedings of IEEE, vol. 103, iss. 11, pp. 2196-2207, 2015.

4. **Prashant Vaidyanathan**, Nitish Malhotra, and Jagadish Nayak, *A new encryption technique for the secured transmission and storage of text information with medical images.*, Engineering Review 32, no. 1, pp. 57-63, 2012.

Conference Papers

5. Curtis Madsen, **Prashant Vaidyanathan**, Sadra Sadraddini, Cristian Ioan Vasile, Nicholas A. DeLateur, Ron Weiss, Douglas Densmore, Calin Belta, *Compositional Signal Temporal Logic with Applications to Synthetic Biology* (Accepted to CDC 2018).
6. **Prashant Vaidyanathan**, Rachael Ivison, Giuseppe Bombara, Nicholas A. DeLateur, Ron Weiss, Douglas Densmore, and Calin Belta, *Grid-Based Temporal Logic Inference*, 56th IEEE Conference on Decision and Control, Melbourne, Australia, 2017.
7. Jagadish Nayak, Nitish Malhotra, and **Prashant Vaidyanathan**, *A new encryption technique for the secured transmission and storage of text information with medical images.*, IN-TECH 2011.

In Preparation

8. **Prashant Vaidyanathan**, Evan Appleton, David Tran, Alex Vahid, George Church, and Douglas Densmore, *Fluorescent Protein Selection.*
9. Boyan Yordanov, Paul Grant, **Prashant Vaidyanathan**, Andrew Phillips, Genetic Engineering of Living Cells 2.0.
10. **Prashant Vaidyanathan**, Nicholas A. Delateur, Curtis Madsen, Evan Appleton, Calin Belta, Ron Weiss, Douglas Densmore, *Automated Design of Genetic Systems with Temporal Verification.*

Tools, Frameworks, and Projects

Synthetic Biology

- **Cello** - A compiler to automate the design of Boolean Genetic circuits - `www.cellocad.org`
- **Phoenix** - Automated design of genetic circuits with temporal verification
- **NetSynth** - A Logic Synthesis and Logic Minimization tool for Synthetic Biology and Microfluidics
- **Clotho** - A platform to Store, Exchange, and Interact with Synthetic Biological Data - `www.clothocad.org`
- **FP Selection** - Selection algorithms to pick an optimal set of Fluorophores for a Flow Cytometer
- **Grid TLI** - A Temporal Logic Inference tool to infer temporal properties from data
- **STL-Sharp** - A metric to compute the distance between two bounded Signal Temporal Logic formulas
- **FSBOL** - An F# implementation for the Synthetic Biology Open Language data structure

Miscellaneous

- **Kocoon Baby Mote** - An embedded device to monitor vital signs (body temperature, pulse rate, and humidity) for infants and send real time alerts to doctors and hospital personnel to facilitate fast and precise medical response
- **Cloud Scrubs** - A multi-platform electronic data storage and retrieval system to store and secure medical information for patients and allow doctors easy access to data while maintaining doctor-patient confidentiality

Teaching

Teaching Fellow

- Boston University, EC 327 - Introduction to Software Engineering (Spring 2016)
- Boston University, EC 500 D1 - Computational Synthetic Biology for Engineers (Spring 2016)
- Boston University, EC 551 - Advanced Digital Design with Verilog and FPGAs (Spring 2014, Spring 2015)

Guest Lecturer

- Boston University, EC 500 D1 - Computational Synthetic Biology for Engineers (3 Lectures)

- Boston University, EC 327 - Introduction to Software Engineering (3 Lectures)
- Boston University, EC 551 - Advanced Digital Design with Verilog and FPGAs (3 Lectures)
- Boston University, BE 562 - Computational Biology: Genomes, Networks, Evolution (1 Lecture)

Professional Activities

Talks

- MIT Synthetic Biology Center - Data on Tap
- NSF Biological Cyber-Physical Systems - Kickoff meeting

Technical Reviewer

- Engineering Review 2014
- International Workshop on Bio-Design Automation (IWBDA) 2018

Organizing Committee

- International Workshop on Bio-Design Automation (IWBDA) 2018 - Program Committee
- Helped organize Microsoft Imagine Cup UAE Regional Finals in Microsoft Gulf - 2012
- Organized the Windows Phone App Hackathon in Microsoft Gulf - 2012
- Student Convener for the Inter-university Technology Fest - 2011
- Quiz Master for the Inter-university quizzing Event - 2011

Outreach Activities

Mentoring

1. *Boston University Undergraduate Research Opportunity Program (UROP)* mentor, 2013 - 2016
   Mentored **12 undergraduate students**, each for at-least 2 semesters or more
2. *Boston University Research Internship in Science and Engineering (RISE)* mentor, 2016
   Mentored 2 High school students

Workshops

1. *Microsoft - Windows Phone 7 App Workshop, Dubai, UAE, 2012*
   Conducted 20+ workshops in 4 major universities in UAE (BITS Pilani, University of Wollongong, University of Sharjah, American University of Sharjah)
2. *Basics of .NET, Dubai, UAE, 2012*
   Conducted 10+ workshops to train over 30 students in the basics of App and Software development

Technical Proficiency

- **Programming Languages:** C, C++, C#, F#, MATLAB, Java, VB.Net, Verilog, LaTeX
- **Operating Systems:** Linux (Ubuntu, CentOS, Amazon Linux, and RHEL) and Windows
- **Tools and Frameworks:** Amazon EC2, Amazon S3, Visual Studio, Expression Studio, Adobe Illustrator

Research Interests

Logic Synthesis, Synthetic Biology, Formal Methods, Model Checking, Analysis of Algorithms, Computer Architecture, Computer Arithmetic, Reconfigurable Computing, Embedded Systems