

VICKRAM RAJENDRAN

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16 Piersons Ridge, Hockessin, DE 19707

Education

Swarthmore College

Aug. 2015 – May 2018

Bachelor of Arts - Double Major in Mathematics and Computer Science

Swarthmore, PA

- **Honors:** Highest Honors in Mathematics and Computer Science
- **Honors:** Phi Beta Kappa
- **Mathematics:** Honors Math Major prepared in Algebra, Topology, and Complex Analysis
 - * **Coursework:** Several-Variable Calculus, Computational Geometry, Analysis on Manifolds, Complex Analysis, Riemannian Geometry, Topology, Modern Algebra II, Lie Groups/Lie Algebras, Elliptic Curves
- **Computer Science:** Honors Computer Science Minor prepared in Algorithms and Theory of Computation
 - * **Coursework:** Theory of Computation, Algorithms, Machine Learning, Artificial Intelligence, Computer Vision, Operating Systems, Computer Networks, Computer Security, Elliptic Curve Cryptography

Projects

Website: Built a personal website using Node, React, HTML, and CSS that is currently hosted at vickraj.github.io.

Elliptic Curves: Implemented and analyzed algorithms relating to elliptic curves, including efficient computation of the Weil Pairing, elliptic curve factorization, discrete logarithms, ECDSA, and one pass Tripartite Diffie Hellman protocols.

Text Classification: Optimized text-classification algorithms such as Long Short-Term Memory neural networks, Non-negative Matrix Factorization, Latent Dirichlet Allocation, and Hidden Markov Models to identify authors.

Pseudo Random Number Generators: Presented on modern uses of pseudo-random number generators and used number theory to show proofs of their cryptographic security or exploitations of their insecurity.

Independent Research: Research on the algebraic structure of primitive pythagorean triplets to construct new, more efficient algorithms to find triangles satisfying certain properties.

The Worlds Hardest Game AI: Developed an agent to beat levels of the popular flash game "The World's Hardest Game" using Approximate Q-Learning.

General Game Playing: Made an agent to beat arbitrary games using online learning Monte Carlo Tree Search.

Employment

Topology Grader *Swarthmore College Math/Stat Department*

Dec. 2017 – May 2018

- Graded the content and structure of proofs and provided feedback to the 14 students in the double-graded topology seminar covering topics from point-set topology, homotopy theory, simplicial homology, and commutative algebra.

Math Clinician *Swarthmore College Math/Stat Department*

Sep. 2016 – May 2018

- Walk-in mathematics peer tutor for over a hundred students, in all math classes offered at the college.

Front End Web Developer Intern *Extreme Scale Solutions, LLC*

Jul. 2014 – Jan. 2015

- Used PHP/SQL, Javascript, Google Charts, and AJAX techniques to design a front-end in the Drupal framework.
- Implemented and developed R-scripts to integrate the back end of the analysis tool with the front end.

Lead Intern *ANP Technologies, Inc.*

Jun. 2014 – Sep. 2014

- Used Drupal, Java, and Swift to create web and mobile apps to view and modify a database of pesticide tests in food.
- Presented results at the Delaware Bio Breakfast to garner sponsorships such as the Delaware Bioscience Association.

Technical Proficiencies

Mathematical Computing: AMPL, Sage, R, Mathematica, Maple, Matlab, Cinderella, L^AT_EX

Imperative Languages: C, C++, Python, Java

Web Development/Networking: Javascript, JQuery, AJAX, HTML/CSS, SQL/MySQL, Wireshark

Frameworks/Libraries: OpenCV, Drupal, Firebase, Node.js, Angular.js, React.js, Android, IOS

Machine Learning: scikit-learn, Keras in Tensorflow/Theano environments, Tensorflow, PyTorch

Operating Systems/Low Level: Macintosh, Windows 7/8/10, Ubuntu, modifying Linux kernel code, IA32 Assembly

Awards

William Lowell Putnam Mathematical Competition: Top 500 (2017)

HackMIT Admissions Puzzle: Top 50 completions (2016, 2017)