Sonny Arora **Github:** https://github.com/sonnyarora

CONTACT INFORMATION
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Citizenship: U.S.A

WORK EXPERIENCE

Computational Scientist, The Pennsylvania State University, Mahony Lab, July 2019-June 2022

- Apply machine learning methods (neural networks, linear models) developed in the lab to understand the determinants of differential Transcription Factor binding for paralogous Fox Factors.
- Run analyses (peak-calling, motif analysis, chromatin-state calling, clustering, differential gene expression analysis) on next generation sequencing (NGS) data (ChIP-Seq, ATAC-Seq, RNA-Seq, ChIP-Exo).
- Created a web-based visualization tool for NGS data, packaged in Docker, using Python, Javascript, and MySQL.
- Extended alignment pipeline to process data visualization files (bigWigs) and set up infrastructure to store terabytes of data.
- Co-organized a weekly seminar on machine learning and statistics which included graduate students from the math, economics, and bioinformatics and genomics programs. Topics discussed include Hidden Markov Models, Convolutional Neural Networks, and General Linear Models. (May 2019-November 2020)

Visiting Assistant Professor of Mathematics, Emory University, August 2018-May 2019

- Taught courses in Integral and Multivariable Calculus

Software Engineer, Mevio. Inc, September 2011-June 2012

- Created several automated reporting tabs for a data visualization analytics website, saving hours of work a week for business and marketing teams.
- Created backend pipelines for processing website traffic data using Hadoop.
- Pulled data from MySQL and MongoDB databases for business teams.

EDUCATION

Pennsylvania State University

Ph.D. in Mathematics, August 2018

- Advisor: Kirsten Eisentrager
- Topic: Developed an algorithm to construct curves useful for cryptography and for theoretical applications.

University of California at Davis

B.S. in Mathematics, June 2011
B.S. in Computer Science, June 2011

PROGRAMMING EXPERIENCE:

Python, R, Javascript, C++, Java

Publications

Constructing Picard Curves with Complex Multiplication, with Kirsten Eisenträger. *Thirteenth Algorithmic Number Theory Symposium (ANTS XIII) Proceedings*, pages 21-36, 2019.

The twisting Sato-Tate group of the curve $y^2 = x^8 - 14x^2 + 1$, with Victoria Cantoral-Farfan, Aaron Landesman, Davide Lombardo, Jackson S. Morrow. *Mathematische Zeitschrift* (2018): 1-32.

Invited Talks

Number Theory Seminar, Emory University, 2019

Algorithmic Number Theory Symposium XIII, University of Wisconsin - Madison, 2018

Number Theory Seminar, Cornell University, 2017

Algebra and Number Theory Seminar, Pennsylvania State University, 2017

Honors and Awards

Departmental Teaching Award for Graduate Assistants, Spring 2014

Departmental Citation of Excellence, Spring 2011