

Prashanth Ramakrishna

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Long-Term Career Objective: To become a leader in preparing the world technically, philosophically, and politically for a future in which international conflict is exported into cyberspace.

Personal Summary

Gallatin School of Individualized Study, New York University

New York, NY

Senior, The Age of Cybersecurity (equivalent to Math Major, Computer Science Major, and Cybersecurity Minor) Class of Fall 2020

The Mountain School of Milton Academy

Vershire, Vermont

1st Semester 11th Grade

Class of Fall 2013

Shanghai American School Pudong

Shanghai, China

High School

Class of 2015

Relevant Coursework: Calculus I-III, Honors Algorithms, Honors Discrete Math, Honors Linear Algebra, Honors Computer Systems Organization, Abstract Algebra, Chaos and Dynamical Systems, Numerical Optimization, Computer Security, Theory of Computation, Dynamics of the Atmosphere and Climate, Real Analysis, Computer Networking, Probability and Statistics (graduate course), Ordinary Differential Equations, Topology, Applied Cryptography, Network Security, Representative Democracy in the Age of Data

Working Thesis: Ideological Population Dynamics in the Internet Age: Democracy's Final Stress Test?

Programming: Python | Java | GO | C | MatLab | x86

Languages: English (Native Speaker) | Telugu (Fluent) | Mandarin (Conversant) | Spanish (Conversant and Literate)

Esoteric Skills: Woodworking, Farming (building garden beds to animal husbandry), Boulderling, limerick writing

Research/Project Experience

SECURITY

Analyzing Cybercriminal Telegram/Discord Channels

2020 Spring - Present

NYU Center for Cybersecurity, Advisor: Damon McCoy

Subjects: NLP, Big Data

- Analyzing 20 million+ messages on Telegram/Discord channels with known cybercriminal activity in order to find and classify cybercriminal behavioral patterns

Applied Cryptology Projects

2019 Fall

Subjects: Cryptography, Cryptanalysis

- Created Command Line interface for optimizing parameter selection in cryptanalysis of Vigenere ciphertexts
- Implemented FEAL Cipher, then used differential cryptanalysis to retrieve FEAL subkeys
- Implemented triple-Diffie-Hellman Key agreement used for Signal Secure Messaging Protocol

MATH AND BIOLOGY

Modeling Dynamics of Neuronal Populations in Adolescent Rat Brains

2018 Summer

Courant Institute of Mathematical Sciences, Advisor: Aaditya Rangan

Subjects: Differential Equations, Stochastic Calculus

- Provided supporting MatLab simulation evidence for the hypothesis that the signal input responsible for apparent randomness in sleep/wake cycle bouts originates from the Locus Coeruleus

Simulating Interacting Mice

2019 August - Present

Computational Neuroscience Lab, NYU Langone Advisor: Dr. Zhe Chen

Subjects: Agent-Based Modeling

- Developing mouse-interaction simulation in order to generate data for ML characterization of live mouse interaction footage

Modeling Arterial Blood Pulse Pressure Wave Propagation

2018/2019 December-January

Healthcare Innovation Technology Centre, Indian Institute of Technology, Madras Advisor: Nabeel P. M.

Subjects: Fluid Dynamics, Signal Processing, Deep Learning, Graph Theory

- Created novel geometric model for blood pulse wave reflection, then provided validated with Matlab simulations and vivo data – delivered oral presentation in session "Blood Pressure and Cardiovascular Hemodynamics" at *41st IEEE Engineering in Medicine and Biology* located in Berlin, Germany
- Conducted analysis of continuous arterial dual-diameter waveform features to reduce overfitting in ML estimation of blood pressure – submitted to *42nd IEEE Engineering in Medicine and Biology* in Montreal, Quebec, Canada.

THEORETICAL COMPUTER SCIENCE/GAME THEORY

Literature Review of Nucleolus-Finding Algorithms for Coalitional Games

2019 Fall

Courant Institute of Mathematical Sciences, Advisor: Richard Cole

Subjects: Linear Programming, Coalitional Game Theory

- 20+ paper review on extended simplex algorithms to find the nucleolus of coalitional games

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Exploring Game Theoretic Properties of Rule Manipulation Through Meta-Chess

2017-2018

Stern Graduate School of Business, Advisors: Adam Brandenberger, Raja Panjwani

Subjects: Abstract Algebra (proof methods), Algorithmic Construction

- Developed new variant of Chess in which the rules of the game change dynamically as play unfolds – accepted by *Journal of Chess Research*

OTHER

Mitigation Strategies for Methane Emissions from American Beef/Dairy Production

2019 Summer

Center for Atmosphere Ocean Science, Courant Institute of Mathematical Sciences, Advisor: Edwin Gerber

Subjects: Differential Equations, Monte Carlo Error Analysis

- Awarded Horn Family Fund Research Fellowship for Environmental Science to study the effects of various emissions mitigation strategies in the American beef cattle industry on atmospheric methane content

Work Experience

Research Assistant to Joshua Jelly-Schapiro

2017-2018

New York Review of Books, New Yorker, Institute for Public Knowledge

- Researcher for biography of David Sullivan, prolific private investigator specializing in cult groups – archived 16000+ Sullivan emails and provided reports on particular cult groups
- Performed general tasks assigned on an ad-hoc basis by Mr. Jelly-Schapiro

The Millennium School

2015-2016

Millennium Fellow

- Developed a new conflict resolution/disciplinary system for an experimental middle school in San Francisco

Seeds of Peace

2011-2019

Camper, Peer Support, Bunk Counselor

- Led arts activities for teenagers from Israel, Palestine, Egypt, Jordan, India, Afghanistan, United States, and U.K.
- Managed a bunk of 16 boys along with three co-counselors

Freelance Investigative Reporting

2016-2018

- Conflict reporting in Israel-Palestine (three months)
- Long distance hiking culture on the Appalachian Trail (one month)
- Last surviving Ellis Island Ferry, Yankee, docked in Staten Island (one month)

Publications

Scientific

1. Novel Geometric Representation for One-Dimensional Model of Arterial Blood Pulse Wave Propagation – *41st IEEE Engineering in Medicine and Biology*, Berlin, Germany, First Author
2. Cuffless Blood Pressure Estimation Using Features Extracted from Carotid Dual-Diameter Waveforms – *(submitted) 42nd IEEE Engineering in Medicine and Biology*, Montreal, Quebec, Canada, First Author
3. Metachess: A self-Modifying Chess Variant – *Journal of Chess Research*, Accepted, First Author
4. Linear Programming Scheme for Optimizing Security in Wireless Networks – *(working)*, First Author
5. S. aureus Bacteremia Predictive Modeling Analytics: Building a Physician Aid Tool to Streamline Blood Culture Workflow – *(working)*, 3rd Author, Division of Infectious Diseases, Mayo Clinic, FL

Non-Academic

1. Philosophy of Mathematics: A Conversation with Steven Strogatz – *New York Times (Forthcoming)*
2. How Generation Z's Unprecedented Childhood May Collapse Democratic Society: A Conversation with Jonathan Haidt – *New York Times (Forthcoming)*
3. There's Just No Doubt That It Will Change the World: David Chalmers on V.R. and A.I. – *New York Times*
4. We Want To Get Out Of Ourselves As Much As We're Obsessed With Ourselves: An Interview with Michael Pollan – *The Believer Magazine*
5. An Anarchy of Anachronism: An Interview with Poet Ishion Hutchinson – *The Believer Magazine*
6. Ars Poetica: Poeticizing Mizrahi Inequality in Israel – *The Believer Magazine*
7. Everybody Comes From Somewhere: An Interview with Writer Amos Oz – *The Believer Magazine*
8. If Musical Keys Were Novels ... – *The Believer Magazine*
9. Invisible Foreigner – *The Columbia Spectator*

Three Security Texts

- 1) **Applied Cryptography by Bruce Schneier & Security Engineering: A Guide to Building Dependable Distributed Systems by Ross Anderson:** Security bibles! I credit these books with whatever technical/philosophical foundation I have.
- 2) **Reflections on Trusting Trust by Ken Thompson:** You can't truly trust anyone but yourself. Even then, unintentional self-sabotage is a persistent consequence of human error. Living like this, though, is untenable and unenjoyable. So, I choose to warily trust and cooperate with the "good guys" who seem to be defending democratic structures. If I get burned, oh well.