

## EDUCATION

**Princeton University, Princeton, NJ** Sept 2018 – Current

PhD in Electrical Engineering, GPA: 3.925/4.0

Research topic: *Inference of Dynamic Networks* advised by Prof. H. Vincent Poor, Prof. Miklós Rácz

**Carnegie Mellon University, Pittsburgh, PA** May 2018

Bachelor of Science in Electrical and Computer Engineering, Minor in Mathematics, GPA: 3.8/4.0

CIT Honors Research: *Deterministic approximation of stochastic games* with Prof. Soumya Kar, ECE

## PUBLICATIONS

\* denotes publications in alphabetical order

- (Preprint) **A. Sridhar**, H. V. Poor. Sequential Estimation of Network Cascades. May 2020. *Accepted to Asilomar 2020*.
- B. Swenson, **A. Sridhar**, H. V. Poor. On Distributed Stochastic Gradient Algorithms for Global Optimization. *In the Proceedings of ICASSP 2020*.
- \*(Preprint) M. Z. Rácz, **A. Sridhar**. Correlated Randomly Growing Graphs. April 2020
- (Preprint) **A. Sridhar**, H. V. Poor. Bayes-optimal Methods for Finding the Source of a Cascade. Feb 2020
- J. Blocki, **A. Sridhar**: Client-CASH: Protecting Master Passwords against Offline Attacks. *In the Proceedings of ASIACCS 2016*.
- (Submitted) O. Yagan, **A. Sridhar**, R. Eletreby, S. A. Levin, J. B. Plotkin, H. V. Poor. Modeling and Analysis of the Spread of COVID-19 under a Multiple-strain Model with Mutations. Aug 2020.
- (Working paper) **A. Sridhar**, S. Kar. The Mean-field Limit of Stochastic Population Processes over Networks with Incomplete Information.
- \*(Working paper) M. Z. Rácz, **A. Sridhar**, J. Ugander. Distinguishing Graph Growth Mechanisms: Preferential Attachment vs. Models with Fitness.
- (Working paper) Y. Tian, **A. Sridhar**, O. Yagan, H. V. Poor. Analysis of the Impact of Mask-Wearing in Viral Spread: Implications for COVID-19.

## AWARDS

- Finalist for the INFORMS-APS Best Student Paper Award 2020 for *Correlated Randomly Growing Graphs* (one of four selected student papers in applied probability and statistics)
- Princeton First-Year Fellowship (2018-2019): granted full funding for the first year of graduate studies
- Dean's List Honoree for 2017, 2016 and 2015, Carnegie Institute of Technology, Carnegie Mellon University
- Enrolled in Math Studies: accelerated theoretical math curriculum, accepting 15 students per year, Aug 2015 – May 2017.
- Intel International Science & Engineering Fair (ISEF) 2014 Finalist – Physics Category
- Achieved a score of 22 in the 75<sup>th</sup> Annual Putnam Competition
- Michigan Math Prize Competition, Bronze Award - placed 18 (2014) and 26 (2013) in state of Michigan.

## TALKS

**Correlated Randomly Growing Graphs**, joint work with Miklós Rácz (Princeton)

- IMS-Bernoulli One World Symposium. Mannheim, Germany, Aug 2020.
- MIFODS Workshop: Learning under Complex Structure. Boston, MA (MIT), Jan 2020

**Mean-field limits for Stochastic Population Processes on Networks**, joint work with Soumya Kar (CMU)

- 49<sup>th</sup> Probability Summer School. Saint-Flour, France, July 2019.
- Invited talk, Dept. of Electrical and Computer Engineering, Carnegie Mellon University. Pittsburgh, PA, Dec 2018.
- Invited talk, Dept. of Operations Research and Financial Engineering, Princeton University. Princeton, NJ, Nov 2018.
- ECE Summer Undergraduate Research Symposium, Carnegie Mellon University. Pittsburgh, PA, July 2017

### **Carnegie Mellon Math Club Talk**

Pittsburgh, PA, Mar 2017

*Catastrophic Failure of Intuition*, presented along with another undergraduate student

- Gave a crash course in basic real analysis and did a conceptual and rigorous walkthrough of a function that is continuous at a single point, the Weierstrass function and the Cantor function

### **ACM ASIACCS Conference 2016**

Xi'an, China, May 2016

*Client-CASH: Protecting Master Passwords against Offline Attacks*, supervised by Dr. Jeremiah Blocki

- Formulated and proved the security of a client-side password manager that is resilient against offline attacks (i.e. the hacker is able to breach the server)

### **Meeting of the Minds Undergraduate Research Symposium 2015**

Pittsburgh, PA, May 2015

*Raga-Identifying Program*, independent research

- Formulated a systematic method of identifying note fluctuations that characterize *ragas* in South Indian Classical Music

## **RESEARCH EXPERIENCES**

### **Princeton University, Department of Electrical Engineering**

Princeton, NJ, Nov 2018 – Current

Graduate Research Assistant

Supervisors: Prof. H. Vincent Poor (ELE), Prof. Miklós Rácz (ORFE)

- Studying inference problems such as Community Detection in randomly growing graphs
- Optimal inference for finding the source of a network cascade

### **École Polytechnique Fédérale de Lausanne (EPFL), Department of Information and Computer Sciences**

Lausanne, Switzerland, June 2018 – Aug 2018

Research Assistant

Supervisor: Elisa Celis

- Studied the influence of individual attributes (e.g., gender, ethnicity) on link formation in social networks, and used the findings to improve models of network formation
- Analysis done on the AddHealth dataset, which has tracked the physical health, mental health and social connections of a set of people for over 20+ years. Participants went to the same high school / middle school together.

### **Carnegie Mellon University, Department of Electrical and Computer Engineering**

Pittsburgh, PA, Oct 2016 – May 2018

Undergraduate Research Assistant

Supervisor: Prof. Soumya Kar

- Formulating protocols for distributed population games over a network, and finding conditions for which the long-term behavior of the population tends to a Nash Equilibrium
- Investigating implementations of Distributed Fictitious Play in which agents need only observe rather than communicate with neighbors
- Exploring social learning problems in which one can utilize network effects to learn agent preferences (joint work with Dean Ramayya Krishnan, Heinz College of Information Systems, Public Policy and Management)

### **Carnegie Mellon University, Department of Mathematics**

Pittsburgh, PA, Jan 2016 – May 2016

Undergraduate Research Assistant

Supervisor: Prof. Steven Miller (College of William and Mary, Department of Mathematics)

- Worked on tightening bounds for the average rank of L-function families with respect to the 2-level density, which involved finding the optimal test function for the tightest bound
- Analytically computed optimal bounds for simple classes of input test functions, such as step functions, triangles and sinusoids
- Proposed an iterative procedure to find the optimal pair of test functions

## **Carnegie Mellon University, CyLab**

Pittsburgh, PA, Oct 2014 – May 2015

Undergraduate Research Assistant

Supervisor: Prof. Anupam Datta, Dr. Jeremiah Blocki

- Helped with the structure and design of a human-friendly password manager / generator that creates highly secure and usable passwords based on mnemonic cues
- Implemented the password manager on a website by coding in HTML and Java

## **Northwestern University, Department of Chemistry**

Evanston, IL, Jun 2012 – Dec 2013

High School Research Assistant

Supervisor: Prof. Tamar Seideman, Dr. Matthew Sonntag

- Applied a subgridding approach for the Finite-Difference Time-Domain (FDTD) algorithm to perform high-resolution simulations of the tip-substrate electromagnetic field for Tip-Enhanced Raman Spectroscopy (TERS)
- Analyzed the effects of different tip and substrate materials in terms of the resolution and quality of the tip-substrate electromagnetic field in simulations

## **PROJECTS**

### **Electrical and Computer Engineering Senior Capstone Project (Carnegie Mellon University)**

Pittsburgh, PA, Jan 2017 – May 2017

MARCO, completed with two other undergraduate students

- Developed an application that analyzes the surrounding environment via camera to determine one's location within a building
- Prototyped in MATLAB, code written in Java and C
- Implemented on Android platform as well as on EPSON BT-300 Augmented Reality glasses

### **18-793 Image and Video Processing Course Term Project (Carnegie Mellon University)**

Pittsburgh, PA, Nov 2016 – Dec 2016

*Segmentation of Circular Features in the Radon Domain*, completed with another undergraduate student

- Designed a fast segmentation algorithm which can take raw tomography data as input without having to transform the data into a 2D image (which is done commercially)
- Segmentation had accurate results for both artificially-created test images as well as real medical images with circular blood vessels

### **15-112 Fundamentals of Programming Course Term Project (Carnegie Mellon University)**

Pittsburgh, PA, Nov 2014 – Dec 2014

*AudioShop*

- Authored software that cleans up the quality of a webcam music recording by analyzing the musician's fingerings to determine the corresponding notes played at a given time. Implemented in Python
- Demo: <https://www.youtube.com/watch?v=XO5OXKEO8rE>
- Code: <https://github.com/anisridhar/AudioShop>

## **TEACHING**

### **Head Graduate TA, ELE 201 Information Signals, Dept. of Electrical Engineering, Princeton University**

Princeton, NJ, Feb 2020 – Current

- Designed and taught content for a first signal processing course
- Created innovative content for online teaching settings
- Graded assignments and supervised other TAs

### **EXCEL Leader for 21-127 Concepts of Mathematics, Carnegie Mellon Academic Development**

Pittsburgh, PA, Sep 2015 – May 2018

- Designed and taught course content for Concepts of Mathematics, a first proof-based mathematics course
- Focus is not only on content, but also on active student learning, improving student study skills and building student work ethic in a collaborative learning environment
- Planned weekly review sessions for 25 students each semester
- Team lead for the six other leaders for the course

### **EXCEL and SI Head Supervisor, Carnegie Mellon Academic Development**

Pittsburgh, PA, Jan 2017 – May 2018

- Hiring, training, and supervising ~50 student EXCEL leaders who teach a variety of courses in engineering, mathematics and the sciences
- Handle various administrative tasks for the SI and EXCEL programs
- Teaching assistant for 99-251 Fundamentals of Supplemental Instruction

## **EMPLOYMENT**

### **Science Undergraduate Lab Intern, Argonne National Lab (Department of Energy)**

Lemont, IL, Jun 2016 – Aug 2016

Project title: *DSP Algorithm Optimizations for the Orbit Feedback System in the APS Upgrade*

- Created error-correction feedback algorithms for the Advanced Photon Source (APS) synchrotron that is 20 times faster than the existing algorithm, allowing for 22.6 kHz cycles
- Algorithms involved cache optimization, distribution over parallel cores of the DSP, and digital filter representations
- To be implemented in the APS Upgrade

## **RELEVANT COURSES (PhD level)**

Image and Video Processing  
Measure and Integration  
Advanced Real Analysis (Sobolev Spaces & Interpolation)  
Functional Analysis  
Linear and Nonlinear Optimization  
Mathematics of High-dimensional Data  
Theory of Detection and Estimation  
Extremal Combinatorics  
Metric Dimension Reduction  
Analytic Methods in Theoretical Computer Science  
Probability in High Dimension  
Information Theory and Applications  
Theoretical Deep Learning

## **REFERENCES:**

### **Prof. Miklós Rácz**

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### **Prof. H. Vincent Poor**

Michael Henry Strater University Professor of Electrical Engineering, Princeton University

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### **Prof. Yuxin Chen**

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### **Prof. Soumya Kar**

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