

# Rishi Sharma

rishi.info  
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## SHORT BIO

Rishi is a Ph.D. Student in the Department of Electrical Engineering at Stanford University co-advised by Stefano Ermon and Vijay Pande. He works on various topics in artificial intelligence, including deep generative modeling, deep learning for physical and chemical systems, and computer vision for satellite imagery. Broadly, Rishi is motivated to do high impact work at the intersection of artificial intelligence and geopolitics.

In the past, Rishi has worked on computational neuroscience, coding theory, optimization, and virtual reality. He received a B.S. in Electrical Engineering & Computer Sciences from U.C. Berkeley in 2015, where he was awarded the Warren Dere Design Award for outstanding work in engineering & design.

## EDUCATION

### **STANFORD UNIVERSITY | PH.D. ELECTRICAL ENGINEERING**

September 2016-Present | Stanford, CA

### **UNIVERSITY OF CALIFORNIA, BERKELEY | B.S. ELECTRICAL ENGINEERING & COMPUTER SCIENCES**

Emphasis: Coding Theory, Signal Processing, & Machine Learning

January 2012 - December 2015 | Berkeley, CA

### **YOGA TEACHER TRAINING | RYT-200, RCYT-30**

200 Hour Training (Yoga Tree), 30 Hour Children's Yoga Training (Radiant Child Yoga)

2015 | San Francisco, CA ; Chicago, IL

## RESEARCH POSITIONS

### **STANFORD UNIVERSITY | PANDE LAB**

January 2017 - March 2017 | Stanford, CA

I work in Professor Vijay Pande's lab on problems in artificial intelligence and machine learning, with an eye towards applications in the sciences, including the modeling of physical systems.

### **QUALCOMM BERKELEY RESEARCH | ERROR CORRECTING CODES GROUP**

PRINCIPAL INVESTIGATOR: Mike Luby

May 2014 - December 2014 | Berkeley, CA

Worked on the construction and simulation of a sparse-graph codes for distributed storage applications.

### **UNIVERSITY OF CALIFORNIA, BERKELEY | OPTIMIZATION ALGORITHMS**

January 2014 - December 2014 | Berkeley, CA

Research with Prof. Laurent El Ghaoui on cardinality constrained optimization algorithms for use on large text data.

### **REDWOOD CENTER FOR THEORETICAL NEUROSCIENCE | COMPUTATIONAL NEUROSCIENCE**

December 2012 - December 2013 | Berkeley, CA

Developed learning algorithms for understanding and predicting olfactory response in mice.

### **NEUROVIGIL, INC. | COMPUTATIONAL NEUROSCIENCE**

June 2013 - August 2013 | La Jolla, CA

I worked on building brain-computing interfaces

## PAPERS

(see Google Scholar for up-to-date list)

### **A NOTE ON THE INCEPTION SCORE**

w/ Shane Barratt, ICML 2018 Workshop on Theoretical Foundations and Applications of Deep Generative Models

## **OPTIMIZING FOR GENERALIZATION IN MACHINE LEARNING WITH CROSS-VALIDATION GRADIENTS**

w/ Shane Barratt, In Submission 2018

## **WEAKLY-SUPERVISED DEEP LEARNING OF HEAT TRANSPORT VIA PHYSICS INFORMED LOSS**

w/ Joe Gomes, Amir Farimani, Peter Eastman, and Vijay Pande, In Submission 2018

## **IMPROVED TRAINING WITH CURRICULUM GANS**

w/ Shane Barratt, Stefano Ermon, and Vijay Pande, In Submission 2018

## **DEEP LEARNING PHASE SEGREGATION**

w/ Amir Farimani, Joe Gomes, Franklin Lee, and Vijay Pande, In Submission 2018

## **ITERATIVE HARD THRESHOLDING FOR KEYWORD APPROXIMATION IN LARGE TEXT CORPORA**

w/ Steve Yadlowsky, Preetum Nakkiran, Jingyan Wang, and L. El Ghaoui, Proc. ICMLA 2014

## HONORS, GRANTS, & AWARDS

### **STANFORD GRADUATE FELLOWSHIP | STANFORD UNIVERSITY**

2016

The three-year Stanford Graduate Fellowship in Science and Engineering (SGF) supports exceptional incoming and continuing doctoral students in the natural and social sciences education, and engineering.

### **WARREN DERE DESIGN AWARD | EECS DEPARTMENT: UNIVERSITY OF CALIFORNIA, BERKELEY**

2015

Won for work in spatial audio. This award is presented to graduating seniors in EECS whose accomplishments in engineering design are judged to be most outstanding.

## ENTREPRENEURSHIP

### **STRING THEORY LABS INC | FOUNDER & CHIEF EXECUTIVE OFFICER**

2013 -2016 | Berkeley, CA

- String Theory Labs, Inc. is a spatial audio, virtual reality, and interactive media technologies startup.
- STL provides services including music venue / studio design and content creation. STL uses advanced AVB networking technologies and patented spatial audio technology to synchronize audio, video, and lighting data creating integrated, interactive, and immersive end-to-end solutions for 3D multimedia / sound systems.

## TEACHING

### **EE 126: PROBABILITY THEORY AND STOCHASTIC PROCESSES | GRADUATE STUDENT INSTRUCTOR:**

UNIVERSITY OF CALIFORNIA, BERKELEY

INSTRUCTOR: PROF. KANNAN RAMCHANDRAN

May 2014 - May 2015 | Berkeley, CA

Developed labs for the course to exercise students skills in applied probability. The labs covered a wide diversity of topics including random projections, random graphs, GPS, distributed storage, and computational biology. These labs are still in use by course instructors (as of Spring 2017).

## YOGA & SERVICE

### **YOGA FOR REFORM (PRISON YOGA) | COOK COUNTY SHERIFF'S DEPARTMENT**

September 2015 - March 2016 | Chicago, IL

Taught Yoga & Meditation to inmates in the mental health division of the Cook County Jail, the largest jail in America by population.

### **CHILDREN'S YOGA TEACHER | | GROW CHICAGO**

September 2015 - February 2016 | Chicago, IL

Taught Yoga & Meditation to pre-kindergarten through eighth graders at O'Toole Middle School and AMS Montessori School in Englewood on the South Side of Chicago. Mentored young boys in self-respect, self-efficacy, and self-love.

### **TEACHING ASSISTANT AT YOGA TREE SF | POST-NATAL YOGA**

INSTRUCTOR: JANE AUSTIN

July 2015 - August 2015 | San Francisco, CA

Assisted Jane in post-natal Yoga classes, with moms and newborn babies; Gave mothers individualized attention by attending to their newborn while guiding them through their practice.

## **PROGRAM AMBASSADOR AT YOGA TREE SF | TEACHER TRAINING AMBASSADOR**

July 2015 - August 2015 | San Francisco, CA

Student course assistant for 200-Hour Yoga Tree Teacher Training Program

## **CHILDREN'S HOSPITAL VOLUNTEER | LUCILE PACKARD CHILDREN'S HOSPITAL**

June 2006 - August 2013, Stanford, CA

Provided recreational activities and entertainment to patients in the hospital.

## **SCHOOL TEACHER IN INDIA | UMANG AT SANSKRITI SCHOOL**

June 2010 - July 2010, New Delhi, India

Volunteered with underprivileged youth from the slums of New Delhi, India; taught fourth grade math and English.

## CERTIFICATIONS

### **AMATEUR RADIO LICENSE | FEDERAL COMMUNICATIONS COMMISSION**

March 2014 - March 2024

Call Sign: KK6KJE

## ART EXHIBITIONS & PERFORMANCES

### **SENTIENCE | MULTIMEDIA ART EXHIBITION AND CONCERT**

Location: Publicworks

August 2015 | San Francisco, CA

Motivated as both an artistic expression and a technical demonstration, Rishi's company String Theory Labs integrated live music, graphics, lighting, and interactive multimedia art to infuse Publicworks (a San Francisco night club) with a Sentience of its own. For one night, the club and its guests were merged together as a growing organism, an artistic celebration of the symbiotic relationship between biology and technology. Sentience gave our 500+ attendees an opportunity to see, hear, and feel technology intertwined with the most graceful aspects of humanity: creativity, imagination, and art.

### **LUCIDITY FESTIVAL | LIVE PERFORMANCE AND ART INSTALLATION**

April 2014 | Santa Barbara, CA

Rishi performed and danced while painted head to toe to accompany his friend Wisam's band String Theory performed their original violin, cello, double bass, piano, and electronic compositions live on the main stage at Lucidity Festival. Rishi also collaborated with other artists and engineers to design and build a 10' x 7' circular 16 channel spatialised laser harp, functioning as a step sequencer and modular synthesizer. By intercepting any combination of lasers, unique musical sequences were generated and spatialized through a circular array of speakers using 3-D sound technology developed by Rishi's company String Theory Labs. Sixteen knobs arranged around the instrument were then used to apply audio filters and effects to the generated sequence. This instrument was installed along with a three dimensional projection mapping in a 30 foot geodesic dome and was accompanied by an art gallery curated with multimedia and live painting. Rishi also delivered a lecture on exponential technologies.

## MISC. WORK EXPERIENCE

### **INTERN AT SINGULARITY UNIVERSITY | AUDIOVISUALS**

June 2012 - August 2012 | Moffet Air Field, Mountain View, CA

Audiovisual technician for over 100 terrific lectures from leading innovators in fields ranging from medicine to nanotechnology to clean energy to AI.

### **INTERN AT COUNSYL, INC. | LAB ASSISTANT, PACKAGING**

March 2010 - August 2010 | Redwood City, CA

Lab assistant in genetic testing; assisted shipping and receiving of genetic samples

### **CONCESSIONS STAND OPERATOR | CENTURY 20 MOVIE THEATERS**

June 2009 - August 2009 | Milpitas, CA

Served beverages and popcorn