

# Clayton H. Sanford

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## EDUCATION

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### Brown University

September 2014 - May 2018

*Sc.B. with Honors in Applied Mathematics - Computer Science*

*Overall GPA: 3.90/4.0*

Thesis: "Applying Rademacher-Like Bounds to Combinatorial Samples and Function Selection."

Magna Cum Laude

## RESEARCH EXPERIENCE

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### Rademacher-Like Generalization Bounds

November 2017 - present

*Bigdata Group*

*Brown University Department of Computer Science*

- Researched under Professor Eli Upfal on extending uniform convergence bounds to new applications.
- Proved claims about the novel Cartesian EMD framework and wrote up findings in an honors thesis.
- Applied sample complexity techniques to audio denoising and compression algorithms.
- Architected experimental framework for testing the effectiveness of these bounds.

### Equation-Free Modeling of Traffic Systems

September 2016 - February 2017

*Applied Dynamical Systems Group*

*Brown University Division of Applied Mathematics*

- Researched with Björn Sandstede on modeling high-dimensional traffic models in low-dimensional spaces.
- Defined lifting and restriction operators to map low-dimensional instances to high-dimensional systems and vice-versa.
- Implemented equation-free modeling algorithms in Matlab and conducted simulations.

### Hassenfeld Child Health Innovation Institute Summer Scholar

June 2016 - August 2016

*Fairbrother Lab*

*Brown University Department of Molecular Biology*

- Awarded grant from Hassenfeld Child Health Innovation Institute to conduct scientific research related to child health under supervision of Professor William Fairbrother.
- Build the web framework of Spliceman 2, a tool that assesses the likelihood of mutations affecting RNA splicing.

## INDUSTRY EXPERIENCE

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### Associate Analytics Data Scientist

August 2018 - present

*LinkedIn*

- Used Hive and SQL to create stable and frequently-used datasets that repopulate daily.
- Performed deep-dive analyses on open questions for the LinkedIn Learning product.
- Co-coordinated a bi-weekly machine learning reading group.

### Data Analytics Intern

June 2017 - August 2017

*LinkedIn*

- Analyzed subscription patterns with LinkedIn Learning team using Pig, HDFS, SQL, and Python.
- Contextualized findings in the Learning business and presented to stakeholders.

## PUBLICATIONS

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C. Sanford\*, C. Cousins\*, E. Upfal. "Uniform Convergence Bounds for Codec Selection." *Preprint*.

T. Chin\*, J. Ruth\*, C. Sanford\*, R. Santorella\*, P. Carter, B. Sandstede. "Using Diffusion Maps in Equation-Free Modeling." *Preprint*.

K. Cygan\*, C. Sanford\*, W. Fairbrother. "Spliceman2 - A Computational Web Server That Predicts Sequence Variations in Pre-mRNA Splicing." *Bioinformatics* 33 (18), 2017.

J. Gross\*, C. Sanford\*, G. Kocks\*. "Projected Water Needs and Intervention Strategies in India." *Undergraduate Mathematics and its Applications* 37 (2), 2016.

\* Contributed equally

## AWARDS

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### Computer Science Senior Prize

May 2018

*Brown University*

- Cash prize awarded to the top students in the computer science department.
- Selected by faculty members based on academic achievement and service to the department.

### Outstanding Winner

April 2016

*Interdisciplinary Contest in Modeling*

*Consortium for Mathematics and its Applications*

- Designation given to five out of over 3000 teams for mathematical modeling of water scarcity in the ICM contest.
- Paper published in the UMAP journal as a result.

## RELEVANT COURSEWORK

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**Algorithms and Theory:** Models of Computation, Analysis and Design of Algorithms, Advanced Algorithms Seminar, Computational Linear Algebra, Intro to Cryptography and Cybersecurity

**Artificial Intelligence:** Machine Learning, Artificial Intelligence, Foundations of Prescriptive Analytics, Independent Study for ML research

**Probability and Statistics:** Probability and Computation, Information Theory, Recent Applications in Probability and Statistics, Probabilistic Methods in Computer Science

**Dynamical Systems:** Applied Ordinary Differential Equations, Applied Partial Differential Equations I, Topics in Chaotic Dynamics, Independent Study for Dynamical Systems Research

**Pure Mathematics:** Linear Algebra, Abstract Algebra, Analysis: Functions of One Variable

**Non-Technical:** Persuasive Communication, Classrooms in Context: Public Education in Providence

## TEACHING EXPERIENCE

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### Head Teaching Assistant

April 2017 - December 2017

*Brown University Department of Computer Science*

- Led a staff of 14 UTAs through grading assignments, running review sessions, and holding office hours.
- Hired UTAs after interviewing 35 candidates for the job.
- Managed an Algorithms class with 170 students and coordinated interactive grading sessions and exams.
- Taught an supplemental section on NP-hardness to a group of forty students for 90 minutes.
- Brainstormed, wrote-up, and edited problems for homework assignments and exams.

**Undergraduate Teaching Assistant**

September 2015 - May 2017

*Brown University Departments of CS and Applied Math*

- Served on the course staffs of four courses: Accelerated Intro to CS, Discrete Structures and Probability, Theory of Computation, Topics in Chaotic Dynamics.
- Created problems for and graded homework assignments and exams.
- Hosted office hours for helping students understand course material and solve homework problems.

**Tutor and Volunteer Representative**

January 2015 - May 2016

*Swearer Tutoring Enrichment in Math and Science (STEMS)*

- Tutored math and science in class and after school at a nearby public school in Providence.
- Interviewed potential volunteers and planned meetings to help train tutors.

**Tutor**

September 2011 - June 2014

*Soquel High School*

- Tutored math at homework club after school twice a week for three years.

**LEADERSHIP AND MENTORSHIP EXPERIENCE**

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**President**

February 2015 - May 2018

*Applied Math Department of Undergraduates (APMA DUG)**Brown University*

- Hosted well-attended advising panels for students interested in Applied Math courses and research.
- Created problems for and managed a casual math competition every semester.
- Coordinated lectures by Applied Math faculty members for undergrads every semester.
- Welcomed prospective students and new concentrators by planning department-sponsored celebrations.

**President**

November 2014 - May 2018

*Outing Club**Brown University*

- Led an executive board of forty members that ran trips every weekend of the academic year.
- Managed and apportioned a \$27000 annual budget.
- Recruited, interviewed, and trained new trip leaders.

**Peer Advisor**

September 2017 - May 2018

*Matched Advising Program for Sophomores (MAPS)**Brown University*

- Advised two sophomore Applied Math students as they declared their concentrations and decided on coursework and internships.

**Peer Advisor**

September 2015 - May 2017

*Meiklejohn Peer Advisory Program**Brown University*

- Advised eleven first year students on adjusting to college life, selecting courses, building connections, and finding their academic paths.

**MISCELLANEOUS**

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**Programming Languages  
Technologies**Python, Java, Matlab, SQL, Scala, Javascript, PHP, Perl, LaTeX, SQL  
Hadoop, Spark, Git, Tensorflow**Spoken Languages**

English (native), Spanish (intermediate proficiency)

**Interests**

Backpacking, Climbing, Geography, Fractals, Public Transportation