Clayton H. Sanford

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EDUCATION

Brown University *September 2014 - May 2018*
Sc.B. with Honors in Applied Mathematics - Computer Science Overall GPA: 3.90/4.0
Magna Cum Laude

RESEARCH EXPERIENCE

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.

Learning Across Distributions June 2017 - May 2018
Reinforcement Learning Group *Brown University Department of Computer Science*

- Researched under Professor Michael Littman on using samples drawn from different distributions to select a robust classifier that performs across combinations of those distributions.
- Proved theoretical bounds on effectiveness of new cross-distribution algorithm.
- Implemented algorithm and tested on reinforcement learning games.

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

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

C. Sanford. "Applying Rademacher-Like Bounds to Combinatorial Samples and Function Selection." Honors Thesis, Brown Department of Computer Science, 2018.

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

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

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

TALKS GIVEN

Theories in Action May 2018
"Applying Scientific Research" *Brown University Curricular Resource Center*

· Presented honors thesis and motivated the need for confidence in ML algorithms on a panel to an audience without no expected background in computer science.

Honors Thesis Defense April 2018
Brown University Department of Computer Science

· Successfully defended my thesis in a twenty-minute talk with ten minutes of questions from faculty.

High School Computer Science Class Presentation January 2018
"Machine Learning and Artificial Intelligence" *Soquel High School*

· Introduced high school students to machine learning basics and ethical questions of artificial intelligence in a forty-minute lecture given to two high school computer science classes.

Math Slam March 2017
"Equation-Free Modeling" *Brown University Society for Industrial and Applied Mathematics*

· Ten-minute research talk about independent study with Björn Sandstede on equation-free modeling of high-dimensional dynamical systems.

TEACHING EXPERIENCE

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

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

Programming Languages	Python, Java, Matlab, SQL, Scala, Javascript, PHP, Perl, LaTeX, SQL
Technologies	Hadoop, Spark, Git, Tensorflow
Spoken Languages	English (native), Spanish (intermediate proficiency)
Interests	Backpacking, Climbing, Geography, Fractals, Public Transportation