Rachel Lawrence

CS Theory and Machine Learning

Education

2017 – Present **Ph.D. Computer Science**, *University of California, Berkeley*, Berkeley, CA.

2012–2016 **Bachelor of Science**, *Yale University*, New Haven, CT.
Applied Mathematics with concentration in Computer Science

Work Experience

Research

2016 – Present **Software Engineer**, Reservoir Labs, Inc., New York, NY.
Contributed to development and application of ENSIGN, a high-performance tool for performing unsupervised hypergraph analysis using tensor decompositions. Additionally contributed to creation of a compiler for a specialized SIMD architecture.

2015 – 2016 **Undergraduate Researcher, SUMRY Program**, Yale Department of Mathematics, New Haven, CT.
Used algebraic and combinatorial methods to study the number of 9- and 10-arcs present in the projective plane over an arbitrary finite field, including a proof that the number of 10-arcs in the projective plane over a finite field is not quasipolynomial. Research presented by invitation at MathFest 2015 and the 2015 Young Mathematicians' Conference.
Publications:
Counting Arcs in the Projective Plane via Glynn's Algorithm. (2016), Journal of Geometry.

2016 **Research and Development Intern**, Pixar Animation Studios, Emeryville, CA.
Developed a tool for art-directable cloth simulation for use in Pixar animated feature films as a member of Pixar's research group. Work presented at SIGGRAPH 2016.

2014 **Research Intern**, Yale Center for Statistical Genomics and Proteomics, New Haven, CT.
Applied statistical algorithms and pleiotropic methods to study genetic pathways implicated in Bipolar Disorder and Schizophrenia. Performed quality control pre-processing of data and implemented tests for determining significance of genetic pathways.

2013 **Research Intern**, Yale Department of Mathematics, New Haven, CT.
Engineered algorithms using driven iterated function systems to characterize time-series data. Wrote software to categorize input patterns according to a computed database of signatures using Yale's High Performance Computing cluster.

Teaching

2015, 2016 **Undergraduate Course Grader**, Yale University, New Haven, CT.
Graded exams and problem sets for CPSC 365: Design and Analysis of Algorithms, taught by Professor Daniel Spielman.

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Academic Honors

2017 **National Physical Sciences Consortium Graduate Fellowship**.
National fellowship supporting graduate study

2015 **SUMRY Fellowship**.
Supporting a 10-week intensive summer research program at the Yale Department of Mathematics

2014 **Davenport College Richter Fellowship**.
Yale College fellowship awarded for independent study and research

2013, 2014 **Yale College Dean's Research Fellowship**.
Research fellowship for undergraduate work in STEM

Technical Skills

Experienced with Python, SageMath, and C/C++.

Working knowledge of R, MATLAB, Java, Mathematica, HTML, and CSS.

Other Projects

2013 – 2016 **Splash at Yale**, *Executive Director*.
Directed Yale Splash, a 501(c) non-profit educational outreach organization in which members design and teach courses to local middle and high school students. Coordinated the organization's day-to-day functions, including five annual programs, in addition to teaching classes on a variety of mathematical topics.

2015-2016 **Counting Hamiltonian Cycles**, *Undergraduate Thesis Research*.
Worked with Professor Asaf Ferber to present a new technique for counting and constructing Hamiltonian Cycles in dense and regular directed graphs.

2016 – Present **Learning Unlimited**, *Board Member*.
Served as an elected board member of Learning Unlimited, a nonprofit organization dedicated to providing opportunities for accessible, interdisciplinary learning and academic autonomy for secondary school students. Advised and coordinated educational outreach programs and conferences at participating universities nationwide.

2015 – 2016 **HackYale**, *Board Member and Instructor*, New Haven, CT.
Coordinated, designed, and taught computer science and graphic design courses for students of all backgrounds. Delivered weekly lectures to classes of 25 students.

2014 – 2016 **Yale University ITS**, *Media Technology Project Coordinator*.
Provided support for equipment and media software in the Bass Library Media Lab and the Yale School of Art. Directed a new service connecting student organizations with individualized support for media projects and graphic design. Managed approximately 30 student employees per year.

2011 **RHIC Data Analysis**, *Brookhaven National Laboratory*.
Worked with the STAR Detector physics group at Brookhaven's particle accelerator (RHIC) to identify signatures of heavy antimatter particles in particle collider data, supervised by Dr. Zhangbu Xu.

2010 – 2011 **Ehrenfeucht-Fraïssé Games**, *Independent Research*.
Conducted research on 2-equivalence categories in two-color Ehrenfeucht-Fraïssé Games, supervised by Professor Joel Spencer.