Rachel Lawrence | Yale University

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Education

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

Stony Brook University **Stony Brook, NY**
Young Scholars Program *2010–2012*
Courses in mathematics and statistics through Stony Brook's Young Scholars Program.

Research Interests

Algorithm design and analysis; optimization; graph algorithms; bioinformatics; high performance computing

Experience

Research

Reservoir Labs, Inc. **New York, NY**
Software Engineer *2016 – Present*
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.

Yale Department of Mathematics **New Haven, CT**
Undergraduate Researcher, SUMRY Program *2015 – 2016*
Used algebraic and combinatorial methods to study the number of 10-arcs present in the projective plane over an arbitrary finite field. 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), Submitted to Journal of Geometry.
The Number of 10*-arcs in the Projective Plane over a Finite Field is Not Quasipolynomial*. (2016), Preprint, available online.

Pixar Animation Studios **Emeryville, CA**
Research and Development Intern *2016*
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 the SIGGRAPH 2016 Computer Graphics conference.

Yale Center for Statistical Genomics and Proteomics **New Haven, CT**
Research Intern *2014*
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.

Yale Department of Mathematics **New Haven, CT**
Research Intern *2013*
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

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

Splash at Yale
Executive Director *2013 – 2016*
Directed Yale Splash, a 501(c) non-profit educational outreach organization in which undergraduates 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.

Learning Unlimited
Board Member *2016 – Present*
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.

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

Academic Honors

National Physical Sciences Consortium Graduate Fellowship
Support for up to six years of graduate study through a partnership with the NSA *2017*

SUMRY Fellowship
Fellowship from the Yale Department of Mathematics for a 10-week intensive summer research program *2015*

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

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

Technical Skills

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

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

Other Projects

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

Yale University ITS
Media Technology Project Coordinator *2014 – 2016*
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.

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

Ehrenfeucht-Fraïssé Games
Independent Research *2010 – 2011*
Conducted research on 2-equivalence categories in two-color Ehrenfeucht-Fraïssé Games under the mentorship of NYU Professor Joel Spencer.