John Paul Ryan

Curriculum Vitae

Education

2017–present **PhD in Computer Science**, *Cornell University*, Ithaca, NY.
Concentrating in scientific computing, with focus on developing fast efficient kernel compression algorithms for dense linear systems.

2012–2016 **BA (Honors) in Mathematics and Computer Science**, *New York University*, New York, *3.86/4.00*.
Magna Cum Laude, Phi Beta Kappa,
Math GPA: 3.92, Computer Science GPA: 3.94, Physics (Minor) GPA: 3.92

Industry Experience

Spring 2021 **Tesla**, *Data Science Intern*, Remote.
Created new forecasting framework to predict energy demand surges and need for new chargers within Tesla Supercharger network. Responsibilities also included modeling network resistance to major outage events and developing new retrospective evaluation tools for installation recommendations, and identifying temperature-related seasonality in charging activity around the world.

Summer 2019 **Google**, *Software Engineering Intern*, Cambridge, MA.
Developed TensorFlow forecasting pipeline and accompanying results visualizations and dashboards for a new price prediction model for Google Flights Insights. Also developed several massively parallel processing tools for analysis of price history data.

Summer 2018 **Google**, *Software Engineering Intern*, Los Angeles, CA.
Worked on using existing and developing new machine learning tools to improve Google's Ad services. Internship included benchmarking of current technology, implementation of higher performing techniques, and deployment to production.

Research Experience

January - **Courant Institute**, *Advisor: Miranda Holmes-Cerfon*, New York, NY.
August 2017 Designed and implemented an enumeration algorithm for rigid clusters of spheres in two and three dimensions based on fast algorithms for sparse rigidity matrices. Presently performing statistical mechanical analysis of results for publication.

Summer 2016 **Courant Institute**, *Advisor: Miranda Holmes-Cerfon*, New York, NY.
Built computer simulations to investigate the dynamics of rolling spheres in a cylindrical dish driven by a circular, periodic motion. Our simulations matched experiments nicely, and allowed us to investigate the sensitivity of the system to parameters such as friction, density, and boundary size.

August 2015 **Courant Institute**, *Advisor: Chee Yap*, New York, NY.
Worked on a soft subdivision search algorithm for robot motion planning for disc, triangle, and link robots. Wrote animation in C++ using Qt Creator and OpenGL. See video demonstration on website, under Research.

June - July **Auburn REU in Algebra and Discrete Math**, *Advisor: Peter Johnson*, Auburn, AL.
2015 Spent two months intensively studying algebra and discrete mathematics, especially open and accessible problems. Achieved results in several open problem areas related to abundancy indices and integral distance graphs. See publications below.

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⌂ *jpryan1*

Teaching Experience

2019-2020	TA for CS 5781 Machine Learning Engineering, CS 6210 Matrix Computations (twice) CS 4220 Numerical Analysis, CS 4850 Mathematical Foundations	*Cornell CIS*
Spring 2017	Grader for Fundamental Algorithms and Data Structures	*NYU Department of Computer Science*
2015 - 2016	Department Tutor for Data Structures	*NYU Department of Computer Science*
2015 - 2016	cSplash Lecturer	*Courant Institute*
Spring 2015	Department Tutor for Calculus I-III and Linear Algebra	*NYU Department of Mathematics*
2013 - 2014	SAT Preparatory Teacher	*Kaplan Test Prep*

Academic Achievements

- University Fellowship - Cornell Department of Computer Science
- Computer Science Prize for Academic Excellence - NYU Department of Computer Science
- Perley Lenwood Thorne Medal in Mathematics - NYU Department of Mathematics
- Presidential Honors Scholar - NYU College of Arts and Science
- Dean's Honors List (all four years) - NYU College of Arts and Science

Publications

- **J. P. Ryan**, S. Ament, C. P. Gomes, A. Damle. "The Fast Kernel Transform." *Submitted,* arXiv:2106.04487
- **J. P. Ryan**, A. Damle. "Parallel Skeletonization for Integral Equations in Evolving Multiply-Connected Domains." *SIAM Journal on Scientific Computing,* 43(3), A2320–A2351, (June, 2021)
- L. Lee, **J. P. Ryan**, Y. Lahini, M. Holmes-Cerfon, and S. M. Rubinstein. "Geometric frustration induces the transition between rotation and counterrotation in swirled granular media." *Physical Review E,* 100-012903, (July, 2019)
- C-H. Hsu, **J. P. Ryan**, and C. Yap, "Path Planning for Simple Robots using Soft Subdivision Search," *Multimedia Exposition Proc. 32nd International Symposium on Computational Geometry*, (June, 2016).
- P. Johnson and **J.P. Ryan**, "Coloring Euclidean Spaces So That All Translates of a Given Set Are Rainbow," *Geombinatorics*, 26 (July 2016), pp. 23-30.
- **J. P. Ryan**, "Coloring Blocks of Consecutive Integers to Forbid Three Distances," *Geombinatorics*, 25 (April, 2016), pp. 168-178.
- E. Jones and **J. P. Ryan**, "Theoretical Friends of Finite Proximity," *International Journal of Mathematics and Computer Science*, 10 (2015), pp. 205-216.

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