Santiago Aranguri Diaz

Education

Courant Institute of Mathematical Sciences, New York University

Ph.D. candidate in Mathematics. September 2022 - May 2027 (expected)

Department of Mathematics, Stanford University

B.S. in Mathematics with Honors. September 2018 - June 2022

Research experience

Research Assistantship, Hebrew University of Jerusalem, worked with Professor Ohad Feldheim on characterizing the persistence probability of Gaussian Stationary Processes. (2022)

Undergraduate Thesis, Stanford University, proved a central limit theorem for the Coulomb Gas interacting particle system, advised by Professor Amir Dembo (2022)

Graph Theory and Computational Topology Research, worked on algorithms for efficiently untangling planar curves, with Computer Science Professor Hsien-Chih Chang from Dartmouth College. (2020 - 2021)

International Summer Science Institute, Weizmann Institute, Israel, found a causality relationship between the activity of two parts of the brain in mice, with Ph.D. Student Michael Sokoletsky from the Neuroscience Lab at Weizmann Institute. (2018)

Publications

S. Aranguri, H. Chang, D. Fridman. *Untangling planar graphs and curves by staying positive.* Proceedings of the 2022 Annual ACM-SIAM Symposium on Discrete Algorithms, 211–225.

Summer School

Attended Princeton Machine Learning Theory Summer School. (2023)

Mathematics Graduate Coursework

- ❑ Probability Theory (year-long)
- ❑ Functional Analysis
- ❑ Abstract Algebra
- ❑ Representation Theory
- ❑ Game Theory
- ❑ Harmonic Analysis
- ❑ PDEs from General Relativity
- ❑ Algebraic Topology
- ❑ Differential Topology
- ❑ Differential Geometry
- ❑ Riemann Surfaces
- ❑ Random Graphs and Lattices
- ❑ Partial Differential Equations
- ❑ Gaussian Fields

Reading programs

Fokker-Planck Equation and Optimal Transport, reading papers by Cedric Villani, Felix Otto, and others with Professor Andrea Montanari (2021)

Information Theory, worked on the learning k-juntas problem in Computational Complexity, with Stanford Ph.D. Student Yuval Wigderson (2019)

Concentration of Measure, following the book "Concentration inequalities: A nonasymptotic theory of independence" with Professor Amir Dembo (2021)

Large Deviations, following the book "Large Deviations Techniques and Applications" with Professor Amir Dembo (2021)

CS Graduate Coursework

- ❑ Algorithms
- ❑ Computational Complexity
- ❑ Optimization Theory
- ❑ Machine Learning
- ❑ Deep Learning