Dylan Peifer

Contact Information

Department of Mathematics
310 Malott Hall
Cornell University
Ithaca, NY 14853-4201 USA

Phone: 828-767-9411
E-mail: djp282@cornell.edu
Website: pi.math.cornell.edu/∼djp282
GitHub: www.github.com/dylanpeifer
LinkedIn: www.linkedin.com/in/dylanpeifer

Background

Ph.D. in mathematics applying reinforcement learning to optimize heuristics in Gröbner basis computation, a key bottleneck in computer algebra systems. Experienced in mathematics, programming, data science, machine learning, and problem solving.

Education

Cornell University, Ithaca, NY
Ph.D., Mathematics, expected May 2021
M.S., Computer Science, December 2017, GPA 3.94
Carleton College, Northfield, MN
B.A., Mathematics, June 2014, GPA 3.94

Work

The D. E. Shaw Group, New York City, NY
Quantitative Analyst Intern, Options — May 2019 – August 2019
Analyzed datasets of options volume. Constructed features, trained machine learning models, and evaluated performance in predicting options volume and trade direction.
Cornell University, Ithaca, NY
Teaching Assistant, Mathematics Department — August 2014 – Present
Taught undergraduate multivariable calculus and linear algebra. Developed materials, managed TAs, and performed administrative duties for 600+ student courses.

Skills

- Programming Languages: C, C++, Python, Scheme
- Mathematical Software: GAP, Macaulay2, Mathematica, MATLAB, Singular
- Python Packages: Cython, Matplotlib, NumPy, Pandas, Scikit-Learn, Seaborn, SciPy, StatsModels, SymPy, TensorFlow

Publications

[1] Dylan Peifer. An algorithm for enumerating difference sets. *Journal of Software for Algebra and Geometry* 9 (2019) 35-41.

[2] Omar A. AbuGhneim, Dylan Peifer, and Ken W. Smith. All $(96, 20, 4)$ difference sets and related structures. *Bulletin of the Institute of Combinatorics and its Applications* 85 (2019), 44-59.

[3] Martin Bobb, Stephen Kennedy, Dylan Peifer, and Helen Wong. Roger and Yang's Kauffman bracket arc algebra is finitely generated. *J. Knot Theory Ramifications* 25:6 (2016).

[4] Martin Bobb, Stephen Kennedy, Dylan Peifer, and Helen Wong. Presentations of Roger and Yang's Kauffman bracket arc algebra. *Involve, a Journal of Mathematics* 9:4 (2016), 689-698.

Projects

DifSets (`https://github.com/dylanpeifer/difsets`) A refereed package for the open-source computer algebra system GAP that efficiently implements an exhaustive search for difference sets using group theory and dynamic programming.
GroebnerWalk (`https://github.com/dylanpeifer/GroebnerWalk`) A contributed package for the open-source computer algebra system Macaulay2 that implements the standard and generic Gröbner walk algorithm to quickly compute Gröbner bases.