Dylan Peifer

CONTACT INFORMATION

Department of Mathematics
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RESEARCH INTERESTS

The design and analysis of algorithms for mathematical and scientific computing, particularly the efficient computation of Gröbner bases in computational commutative algebra and algebraic geometry.

EDUCATION

Cornell University, Ithaca, NY

Ph.D., Mathematics, expected June 2019

M.S. Special, Computer Science, August 2017

Carleton College, Northfield, MN

B.A., Mathematics, June 2014

- *summa cum laude*
- distinction in senior integrative exercises and in major
- Certificate of Advanced Study in Russian
- participant, **Math in Moscow** Fall 2012

PUBLICATIONS

[1] 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).

[2] 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.

PRESENTATIONS

[1] *The F_4 Algorithm*, MATH 6140 Final Presentations, Cornell University, May 2017.

[2] *Hidden Field Equations*, Olivetti Club, Cornell University, March 2017.

[3] *The Gröbner Walk*, Olivetti Club, Cornell University, October 2016.

[4] *Hadamard Difference Sets*, Olivetti Club, Cornell University, April 2016.

[5] *Generators of the Arc Algebra*, Binghamton University Graduate Conference in Algebra and Topology, Binghamton University, November 2015.

[6] *A Finite Set of Generators for the Arc Algebra*, Joint Mathematics Meetings, San Antonio, January 2015.

[7] *The Arc Algebra of a Surface*, Math Comps Gala, Carleton College, May 2014.

[8] *Difference Set Transfers* (poster), Joint Mathematics Meetings, Baltimore, January 2014.

[9] *Difference Set Transfers*, Northfield Undergraduate Mathematics Symposium, St. Olaf College, October 2013.

Teaching

Cornell University, Ithaca, NY

Teaching Assistant — August 2014 – Present
Taught twice weekly recitations, held office hours, and graded homework and exams.

- MATH 1106 Calculus for the Life and Social Sciences
- MATH 1910 Calculus for Engineers
- MATH 1920 Multivariable Calculus for Engineers

Carleton College, Northfield, MN

Course Grader — September 2011 – June 2014
Graded weekly homework and provided feedback to students and the instructor.

- MATH 236 Mathematical Structures
- MATH 332 Advanced Linear Algebra

Tutor — September 2011 – June 2014
Worked in the Math Skills Center, a place for students to get help with math classes.

Instructor — January 2012 – June 2014
Taught twice weekly classes, created lesson plans, and developed course syllabi.

- PE 167 Social Dance I
- PE 168 Social Dance II

Experience

Carleton College, Northfield, MN

Research Assistant — June 2014 – August 2014
Studied Roger and Yang's arc algebra, a generalization of the Kauffman bracket skein algebra.

San Diego State University, San Diego, CA

Participant, SDSU Mathematics REU — June 2013 – August 2013
Developed algorithms to construct and enumerate Hadamard difference sets using GAP.

Skills

Computer Programming:

- C (beginner), Java (beginner), Python (intermediate), Scheme (intermediate)

Mathematical Software:

- Macaulay2 (intermediate), Mathematica (intermediate), MATLAB (intermediate), GAP (advanced)

Markup:

- HTML/CSS (beginner), LaTeX (advanced)

Languages:

- English, Russian (intermediate), Spanish (intermediate)

Projects

DifSets A package for GAP that efficiently implements an exhaustive search for difference sets using group theory and dynamic programming.
gbwalk A package for Macaulay2 that implements the standard and generic Gröbner walk algorithm to quickly compute Gröbner bases.

Graduate Coursework

Algebra I, Real Analysis, Differentiable Manifolds, Algebra II, Algebraic Geometry, Noncommutative Algebra, Commutative Algebra, Algebraic Number Theory, Homotopical Algebra, Lie Algebras
Analysis of Algorithms, Matrix Computations, Advanced Programming Languages, Theory of Computing

Awards

Carleton College

- Mortar Board Prize
- Phi Beta Kappa first year student prize
- Dean's List 2011-2013

Other

- member Phi Beta Kappa
- National Merit Scholar

References

Helen Wong, Assistant Professor of Mathematics, Carleton College
Undergraduate Research Advisor

Stephen Kennedy, Professor of Mathematics, Carleton College
Undergraduate Advisor

Michael Stillman, Professor of Mathematics, Cornell University
Graduate Advisor