Dongshu Dai

Curriculum Vitae

Updated February 20, 2023

Email: d9dai@uwaterloo.ca **Website**: GitHub

Research interests

Toric Geometry, Tropical Geometry, Algebraic Combinatorics

Education

University Of Waterloo Waterloo, Ontario, Canada

Master in Pure Mathematics Fall 2022 – Present
Major GPA: 4.00/4.00
Supervisor: Matthew Satriano

University Of Waterloo Waterloo, Ontario, Canada
BA in Mathematics Fall 2018 – Fall 2022
Major GPA: 3.81/4.00

Scholarships&Awards

NSERC Undergraduate Student Research Award 2021
President's Research Award 2021
President's Scholarship of Distinction 2019

Research experience

Master in Pure Mathematics
Supervisor: Matthew Satriano (University of Waterloo) Fall 2022–Fall 2023
Resolution property of toriv varities and related topics in equivariant vector bundles. Develop theoretical tools and algorithms for computational purposes, and implement such codes in Python. Examine various family of toric vector bundles (e.g. Nori finite bundles) to abstract possible patterns as high dimension analogies of existing results on the moduli space of toric bundles.

Undergraduate Research Assistant In Algebraic Geometry
Mentors: Matthew Satriano (University of Waterloo) April – August 2021
Examed possible generalizations of previous lower bound on effective threshold for special family of weighted projective planes; utilized SageMath and various tools from geometry, combinatorics and number theory to attack the problem.

Undergraduate Research Assistant In Number Theory
Mentors: Wentang Kuo (University of Waterloo) April – August 2020
Researched class number problem and related notions in both algebraic and analytic number theory setting; analyzed the main tools used in the major breakthrough of the subject.

Skills

Programming

Proficient in: Python/SageMath, Macaulay2
Familiar with: C, C++

Teaching Experience

MATH 145, Advanced Algebra I, Teaching Assistant	Fall 2022
MATH 115, Linear Algebra For Engineering, Teach Assistant	Fall 2022
MATH 146, Advanced Linear Algebra I, Teaching Assistant	Winter 2023
MATH 235, Linear Algebra II, Teaching Assistant	Winter 2023

Advanced Courses

Finished

PMATH 445: Representations of Fintie Groups	Grade: 85
PMATH 446: Introduction to Commutative Algebra	Grade: CR
PMATH 464: Introduction to Algebraic Geometry	Grade: 92
PMATH 441: Algebraic Number Theory	Grade: 100
PMATH 433: Model Theory and Set Theory	Grade: 85
PMATH 450: Lebesgue Integration and Fourier Analysis	Grade: 94
PMATH 499: Reading in Arithmetic Geometry	Grade: 96
PMATH 940: Geometry of Numbers	Grade: 90
PMATH 940: Modular Forms	Grade: 92
PMATH 940: Diophantine Approximation	Grade 91
PMATH 965: Algebraic Stacks	Grade 96
PMATH 965: Toric Varieties	Grade 97
CO 430: Algebraic Enumeration	Grade: 97
CO 463: Convex Optimization and Analysis	Grade: 100
CO 631: Symmetric Function Theory	Grade 96
CO 739: Asymmetric Function Theory	Grade 97
CO 739: Topics In Macdonald Polynomial	Grade 92
CO 739: Combinatorial Commutative Algebra	92

In Progress/Future Courses

PMATH 940: Analytic Methods In Diophantine Problems
PMATH 950: Quantum Representation Theory
CO 739: Analytic And Algorithmic Combinatorics