

Devora Chait-Roth

(347) 957-0582 | dc4451@nyu.edu | www.cs.nyu.edu/~dc4451

EDUCATION

New York University, PhD in Computer Science
Advisor: Thomas Wies

Aug 2020 - Present
Overall GPA 3.828

Macaulay Honors College at Queens College, BA in Mathematics
Concentration in Computer Science

Aug 2016 - May 2020
Overall GPA 4.0

RESEARCH INTERESTS

Formal methods, automated reasoning, verification, logic, programming languages

RESEARCH EXPERIENCE

New York University - Refinement proofs for probabilistic proofs

June 2021 – November 2022

With Thomas Wies and Michael Walfish

Developed Distiller, the first framework for proving soundness of frontend transformations in probabilistic proofs. Distiller relies on proving refinement between the program's original implementation, transformation, and formal specification. Distiller enables safety guarantees for outsourced computing and zero-knowledge proofs. Proofs for benchmarks were mechanized in Viper, a deductive verification tool.

Automated Refinement Proofs

Ongoing

With Thomas Wies

Automating refinement proofs for heap manipulation and concurrent programs. Leveraging extensions of Kleene Algebra and connections to separation logic to aid in program specification and proof automation.

Cornell University - Mechanics, Control, Robotics and Dynamics REU

Summer 2019

With Andy Borum

Used optimal control theory to computationally model stable paths of an elastic rod's continuous deformation under gravity. Proposed theory to describe rod stability in terms of configuration space.

Rutgers University - Sphere Packings and Number Theory REU

Summer 2018

With Alex Kontorovich

Built first systematic catalogue of crystallographic sphere packings arising from polyhedra, reflective extended Bianchi groups, and higher-dimensional quadratic forms. Proved integer properties of the Bianchi group packings. Published results in Journal of Number Theory.

PUBLICATIONS

Kunming Jiang, **Devora Chait-Roth**, Zachary DeStefano, Michael Walfish, and Thomas Wies, "Less is more: refinement proofs for probabilistic proofs." To appear in Proceedings of *IEEE Symposium on Security and Privacy (IEEE S&P)*, 2023.

Devora Chait-Roth, Alisa Cui, Zachary Stier. "A Taxonomy of Crystallographic Sphere Packings." *Journal of Number Theory*, Vol. 207, Feb 2020, pp. 196-246.

RELEVANT COURSEWORK

Computer Science: Honors Programming Languages, Distributed Systems, Honors Algorithms, Artificial Intelligence, Computer Graphics, Discrete Structures, Object-Oriented Programming

Mathematics: Modern Algebra, Real Analysis, Number Theory, Algebraic Topology, Topology, Linear Algebra, Probability and Statistics, Algebraic Structures, Discrete Mathematics, Dynamical Systems, Mathematical Physics, Calculus I, II, III, IV

HONORS AND AWARDS

- **Henry M. MacCracken Fellowship:** NYU, 2020-2026
- **Dean's Doctoral Fellowship:** NYU, 2020-2026
- **Barry Goldwater Scholarship**, for research in mathematics: U.S. national merit scholarship, 2019
- **Thomas A. Budne Memorial Award**, for excellence in mathematics: Queens College, 2019
- **University Scholar**, full tuition merit scholarship: Macaulay Honors College at Queens College, 2016-2020

SKILLS

- C++, OCaml, Python
- Program verification: Viper
- Some familiarity with Coq, Prolog