CONTACT INFORMATION

Nathan Davidov
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EDUCATION

Spring, 2019 - Present, MA in Pure Mathematics, Queens College, CUNY

- Expected graduation date: May 2019.

Fall, 2015 - Fall, 2018, BA in Pure Mathematics, Queens College, CUNY

- Completed the coursework equivalent of a masters (MA) in Pure Mathematics by the time of graduation.
- To graduate Summa Cum Laude.
- Dr. Shripad D. Kulkarni Prizes in recognition for outstanding performance in differential geometry and complex analysis. Typically awarded to graduate students.

EMPLOYMENT HISTORY

Tree Space Working Group

- Studied and developed solutions to open problems at the intersection of mathematics and biology.
- Worked in teams and gave group presentations of proposed solutions to diverse range of students with varying academic backgrounds.
- Surveyed and engaged with current academic literature.
- Wrote results in LaTeX.
- Had results submitted to multiple seminars and published.

2015-2018, Disenfranchised Scholars Initiative

- Worked with at-risk youth on homework assignments and community-oriented projects.
- Developed literacy and mathematics proficiency, as well as preparation for college-entrance exams such as the SAT and ACT.

2013-Present, Private Tutoring

- Provide and execute lesson plans for students 3rd grade and up that ensure academic maturity with emphasis on understanding content.
- Help students dramatically increase test scores for English, History, Chemistry, and Math Regents exams, SAT and PSAT.
- Develop and employ pedagogical tools to overcome adversities faced by disabled students.

PROFESSIONAL SKILLS

Intermediate proficiency in Hebrew
Fluent in Russian
Proficiency in Java & Mathematica

Beginner Proficiency in Python, C++
Proficiency in writing papers with LaTeX

Nathan Davidov

Adjoint School, ACT 2019 application

       My interest in category theory began during my Sophomore year when I was permitted to take a logic course at the CUNY Graduate Center, a conversation began about ZFC and its inadequacies in describing categories, being a wide-eyed (and lowly) undergraduate, I acquainted myself with the subject. The next year I took part in an independent study with Professor Russell Miller at Queens College in computability theory operating out of Soare's newest book on the subject, and I found myself attending the Topos Reading Group, a reading group organized by mathematicians and computer scientists which meets at the CUNY Graduate Center to study Sheaves in Geometry and Logic by Saunders Mac Lane, and occasionally has speakers from various universities come discuss their research. At one such meeting I was served a conscription by Dr. Noson S. Yanofsky of City College in the form of a pre-print of his newest book, Theoretical Computer Science for the Working Category Theorist, charged with reading the text and issuing corrections as I found them. The book gives a realization of computability theory for, as may be derived by its title, category theorists. With all of this being said, Dr. Pieter Hofstra's work excites me immensely, if accepted I think my best place would be in his cohort.

       By the time of writing this I have been accepted to Queens College's Masters program in pure mathematics and plan to graduate this semester. Although I haven't a specific university in mind for my PhD, I think ACT, especially the 2 week conference at Oxford, will provide me the opportunity to take a better survey of the academic landscape before sending off my applications, especially in regard to my research interests, which include computability, logic, HoTT univalent foundations, non-standard analysis, complex analysis, and measure theory.

       I've received an NSF grant from an REU I took part in during my Sophomore year, as such, if accepted, barring the end of the world, I can certainly guarantee my ability to travel to Oxford and meet at the conference for 2 weeks (and perhaps I wouldn't count myself out in the event of the rapture either!)

My preferences are as follows:

1. Pieter Hofstra – Complexity classes, computation and Turing categories.
2. David Spivak – Toward a mathematical foundation for autopoiesis

3. Tobias Fritz – Partial Evaluation, the bar construction, and second-order stochastic dominance
4. Miriam Backens – Simplifying quantum circuits using the ZX-calculus
5. Bartosz Milewski – Traversal optics and profunctors
6. Mehrnoosh Sadrzadeh – Formal and experimental methods to reason about dialogue

Mathematics

Letter of Recommendation for Nathan Davidov:

Nathan Davidov is one of the very best students I have taught at Queens College, CUNY. I have known him for two years. He took the following courses with me: Math 614 (*Functions of real variables*) in Spring 2017, Math 703 (*Point Set Topology*) in Fall 2017, Math 631 (*Differential Geometry*) in Fall 2017, and a Reading Course on *Topics in geomeric function theory* in Fall 2018. He did extremely well on all courses and he received the following grades: **A** on Math 614, **A** on Math 631, **A+** on Math 703, and **A** on the Reading Course. These were all Masters' level courses. He was certainly the best student in his class for all these courses.

Nathan has completed the REU Program titled "Tree-space working group," for which I recommended him. He is currently enrolled in the MA program in Mathematics at Queens College, CUNY. He also received an important award from the Mathematics Department at Queens College, CUNY, in May 2018 – the **Dr. Shripad D. Kulkarni prize** for excellence in Differential Geometry.

Nathan is currently taking two Reading Courses with me at Queens College, CUNY – one on *Probability theory* and the other on *Introduction to Riemann surfces*. He is also taking a Ph.D level course with me at The Graduate Center of the City University of New York. This is the second semeter course on Complex Analysis, which is a very advanced course.

Nathan is an extremely intelleigent, hard-working, and very motivated student. His searching questions and quick grasp of essentials show a keen analytical mind. He has an independent approach, and has a good aptitude for solving problems. He has strong analytical and quantitative skills. He is very quick in assimilating abstract concepts. He is a bright, promising student, keen to be intellectually challenged, and therefore, definitely deserves all support. He is a very conscientious person, with a pleasant personality. I am very confident that he will do well in his
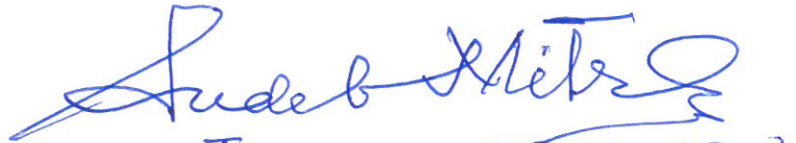
chosen field of endeavour. I recommend him very strongly. Please feel free to contact me if you have any questions.

Sincerely,

Sudeb Mitra
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and
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