# Nilava Metya

Piscataway, NJ - 08854, USA
nilava30@gmail.com nilavam.github.io

## Education

**Rutgers, the State University of New Jersey - New Brunswick** — **Sep '22 – (expected) '27**
*Piscataway, New Jersey, USA*

***Doctor of Philosophy in Mathematics*** | ***CGPA:*** 4.0/4.0
***Master of Science in Mathematics*** | ***CGPA:*** 4.0/4.0 | ***2022 - '24***
*(passed written qualifying exams in first attempt just before program started)*

**Chennai Mathematical Institute** — **Aug '19 – May '22**
*Chennai, Tamil Nadu, India*

***Bachelor of Science (Honours) in Mathematics and Computer Science*** | ***CGPA:*** 9.72/10
*Position:* ***Third*** *(out of* 55 *students)*
*(completed degree requirements in* 2.5 *years)*

**Don Bosco School, Liluah** — **Apr '06 – Mar '19**
*Howrah, West Bengal, India*

***Indian School Certificate (ISC)*** *2019* | ***Percentage:*** 97.25%
*Position:* ***First*** *in science stream (∼* 55 *students),* ***second*** *overall (∼* 180 *students)*
***Indian Certificate of Secondary Education (ICSE)*** *2017* | ***Percentage:*** 96.6%
*Position:* ***First*** *in school (∼* 180 *students)*

## Relevant Coursework

- Quantum Computation
- Matrix Computations
- Differential Equations
- Haskell, Python
- Object Oriented Programming
- Algorithm Design + Analysis
- Discrete Mathematics
- Automata Theory
- Lambda Calculus
- Newtonian, Lagrangian, Hamiltonian mechanics
- Sheaves and Schemes$^{Princeton}$
- Probability$^{Rutgers}$
- Data Mining$^{Rutgers}$
- Convex Optimization$^{Princeton}$
- ML Theory$^{Rutgers}$

## Publications/Preprints

1. G DePaul, S Hoşten, **N Metya**, I Nometa. Degrees of the Wasserstein distance to small toric models. *Journal of Algebraic Statistics*

## Projects/Experience

**Distributionally Robust optimization over dynamical systems** | *with A Sinha* — **current**
**Distributionally Robust Games** | *with B Gangwani and A Sinha* — **current**
**Protein symmetry prediction** | *Data Science Bootcamp at the Erdös Institute* — **Feb - Apr '23**
**Wasserstein distances to toric models** | *with G DePaul, S Hoşten, I Nometa* — **July '23 - Feb '24**
**Inference on growth process of a network** | *Data Mining course at Rutgers* — **Sep - Dec '23**
**Principal Components along Quiver representations** | *Computational Topology course at Rutgers* — **Sep - Dec '23**

## Selection/Attendance in conferences/workshops

**Princeton Machine Learning Theory Summer School** | *Summer School* | Princeton — **Aug '24**
**Frontiers in Complexity Theory: A Graduate Workshop** | *Workshop* | DIMACS, Rutgers, NB — **July '24**
**Efficient Algorithms for High Dimensional Metrics** | *Workshop* | DIMACS, Rutgers, NB — **May '24**
**Bayesian Statistics and Statistical Learning** | *Workshop* | IMSI, Chicago — **Dec '23**
**Algebraic Statistics for Ecological and Biological Systems** | *Workshop* | IMSI, Chicago — **Oct '23**
**Invitation to Algebraic Statistics and Applications** | *Workshop* | IMSI, Chicago — **Sep '23**
**Permutation and Causal Inference: Connections and Applications** | *Workshop* | IMSI, Chicago — **Aug '23**
**Algebraic Methods in Biochemical Reaction Networks** | *Workshop* | MPI, Leipzig — **Jun '23**

## Relevant Talks Delivered

**Principal Components along Quiver representations** | 1 *talk* | Rutgers course: *Computational Topology* **Dec '23**
**Inference on growth process of a network** | 1 *talk* | Rutgers course: *Data Mining* **Dec '23**
**Complexity of Optimization** | 1 *talk* | Rutgers *Pizza Seminar* **Oct '23**
**Complexity of Computing Wasserstein Distance** | 1 *talk* | *Apprenticeship Week* at IMSI, Chicago **Oct '23**
**Kneser graph coloring** | 1 *talk* | Rutgers *Graduate Combinatorics Seminar* **Oct '22**
**Fiedler vector method** | 1 *talk* | CMI course: *Matrix Computations* **May '22**
**Markov Chain Monte Carlo** | 1 *talk* | Internship with *Prof Ramamoorthi* **Sep '21**

## Honours and Awards

**Nominated by Rutgers Math department** for SLMath summer school **Jun '23**
*Summer school at Leipzig - awarded full travel funding. Only two students from Rutgers Math were fully funded by SLMath.*
**Academic Excellence Award** at Rutgers **Sep '22**
*Received a certificate and $100 based on performance in Written Qualifying Exams.*
**Shriram Scholarship** at CMI **'19 – '22**
*Received institutional fee waiver and monthly stipend (based on entrance exam).*
**Ranked $4^{th}$ nationally at the *Bachelor of Statistics* (B.Stat.) entrance examination** **'19**
*Indian Statistical Institute (ISI)*
**Informatics Olympiad** **'17, '18, '19**
*Selected among (approx) top 100-130 school students in India in **Zonal Informatics Olympiad** (ZIO).*
**Mathematical Olympiad** **Jan '18**
*Selected for **Indian National Mathematical Olympiad** (INMO) **Training Camp** | top 30 school students in West Bengal.*
**Program in Mathematics for Young Scientists (PROMYS)** **'18, '19, '20, '21**
*Awarded the **Tara and Jasubhai Mehta Fellowship** to PROMYS (among 5 Indian school students in 2018) based on a competitive process. Participated twice as a student ('18, '19) and twice as a counselor ('20, '21).*

**Others**

- Qualified for **International Collegiate Programming Contest** (ICPC) Kharagpur regionals and Amritapuri regionals in 2019 and secured rank 35 among (approx) 90 university teams at Kharagpur.
- Selected among top 30 students in India to participate in **Scholastic Test of Excellence in Mathematical Sciences** (STEMS) camp at CMI in 2018, based on a competitive exam (across grades $9-12$ and across Math, Physics, Computer Science).
- Secured the **third position** in **Mathematics Talent Reward Programme** (MTRP) 2016, organized by ISI Kolkata, based on a competitive exam and quizzes at a camp.

## Selected Teaching/Grading experience

**Grader** | Rutgers University **Sep '22 – May '24**
**Teaching Assistant (Recitation Leader)** | Rutgers University **Sep '23 – May '24**
**Head Counselor at PROMYS India** | IISc Bangalore **May – Jun '23**
**Teaching Assistant** | Chennai Mathematical Institute **Dec '20 – May '22**
**Faculty at Ramanujan School of Mathematics** | Kolkata **May '19 – July '22**
Taught high-school students competitive math for math olympiad, CMI, ISI entrance exams
**Counselor at PROMYS** | Boston University (online) **Jul – Aug '20, '21**

## Skills

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|---|---|
| **Research** | Optimization and AI/ML in game theory, especially distributionally robust optimization |
| **Soft-skills** | "Can learn it" attitude, Active team-worker, collaborative problem solver, |
| **Languages** | Bengali (mother tongue), English (fluent), Hindi (fluent) |
| **Programming** | Python, C++, R, Haskell, MATLAB, JAVA, HTML, SageMath, Macaulay2 |
| **Documentation** | LaTeX, Microsoft Word |