

Pritam Chandra

[Website](#), [Google Scholar](#), [Github](#)

pritamchandra18@gmail.com

Interests and Skills: Matrix Analysis, Post-Quantum Cryptography, Machine Learning Theory, Python, Hugo

EDUCATION

	Ashoka University , Sonipat, Haryana	cgpa/4
2021–2022	Diploma in Advanced Studies and Research [DipASR] Mathematics <i>Capstone Thesis:</i> Norm Inequalities Related to the Cartesian Decomposition of Matrices (under Rajendra Bhatia)	3.93
2018–2021	Bachelor of Science (Honours) Mathematics [major] Computer Science [minor] <i>Accolades:</i> Best Graduating Student Award, Summa Cum Laude	3.94 Major–4 Minor–4

JOURNAL PUBLICATIONS

2026	Cartesian Decomposition and Schatten Norms: On the Sharpness of Some Inequalities of Bhatia and Zhan Pritam Chandra <i>Indian Journal of Pure and Applied Mathematics</i>
2024	Learning Arithmetic Formulas in the Presence of Noise: A General Framework and Applications to Unsupervised Learning Pritam Chandra , Ankit Garg, Neeraj Kayal, Kunal Mittal, Tanmay Sinha <i>Innovations in Theoretical Computer Science (ITCS)</i>

EXPERIENCE

2025–present	Independent Research Work — Matrix Analysis Ashoka University <i>with</i> Rajendra Bhatia
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Investigating new inequalities between different “means” of positive definite matrices at the level of operator orders (Loewner order, near order), eigenvalues and norms.

2025–2026	Research Associate — Post-quantum Cryptography (PQC) Ashoka University <i>with</i> Mahavir Jhanwar
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Studying several lattice-based PQC paradigms with a special focus on the GPV framework and the [Falcon](#) signature scheme. Curating [preprints and expositions](#) that present the state-of-the-art cryptographic algorithms and their analyses from scratch, feature a structured organization of the literature and some original proofs, accessible with the knowledge of only elementary linear algebra.

2022–2024	Research Fellow — Unsupervised Learning, Machine Learning Theory Microsoft Research India <i>advised by</i> Neeraj Kayal , Ankit Garg , Navin Goyal
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Designed and implemented a meta-algorithm that solves several unsupervised learning problems. Analyzed the algorithm in the smoothed setting and quantified its robustness to noise by bounding the singular values of relevant linear operators. Tested and demonstrated the efficiency of the framework for specific applications like subspace clustering, mixtures of Gaussians, tensor decomposition.

Completely characterized the gradient flow on two-layer linear networks whose input layer is diagonal. Using this, proved guarantees on convergence of single-layer transformers on a class of sequence-to-sequence tasks.

As part of a new first-principle-based learning approach, developed and implemented an interactive shape identification application that could recognize characters from arbitrary and unseen scripts.

ACADEMIC SERVICE

2026 Two reviews for the journal *Linear Algebra and its Applications*. Contribution acknowledged in the published article.

SELECT PREPRINTS AND WORKING PAPERS

- 2026 Eigenvalue Inequalities for Some Matrix Means
Rajendra Bhatia, Pritam **Chandra**
In submission at *Acta Scientiarum Mathematicarum*
- 2026 [An Elementary Introduction to Smoothing Parameter Bounds](#)
Pritam **Chandra**
Manuscript in preparation for *Cryptology ePrint Archive*
- 2025 [An Exposition on Fast Fourier Orthogonalization](#)
Pritam **Chandra**
Manuscript in preparation for *Cryptology ePrint Archive*
- 2024 Towards Analyzing Self-Attention via Linear Neural Networks
Pritam **Chandra**, Ankit Garg, Neeraj Kayal, Kunal Mittal, Tanmay Sinha
Under revision for *International Conference on Learning Representations (ICLR)*

TEACHING EXPERIENCE

Teaching Fellow
[Ashoka University](#) Designed the course content, held regular lectures, curated exams and assignments, graded papers, and handled the logistics for the following courses. Received an average student evaluation rating of 4.89 and 4.34 (out of 5) in two of them.

Year	Level ¹	Course	Primary Instructor	Strength
2026	2	Probability and Statistics [Lecture Notes]	Abhishek Khetan	40
2025	4	Topics in Matrix Analysis	Rajendra Bhatia	6
2025	3	Matrix Analysis [Lecture Notes]	Rajendra Bhatia	15

Teaching Assistant
[Ashoka University](#) Tutored the students in regular discussion sessions, problem-solving sessions, one-on-one office hours, and graded papers for the following courses.

Year	Level ¹	Course	Primary Instructor	Strength
2021	3	Matrix Analysis	Rajendra Bhatia	20
2020	2	Algorithm Design and Analysis	Subhash Bhalla	40
2020	2	Linear Algebra	Kumarjit Saha	40
2019	3	Discrete Mathematics	Goutam Paul	80

¹ "Level" indicates the minimum academic year that is prerequisite for taking the course.

SELECT INDEPENDENT PROJECTS

[Futoshiki Solver](#) 2025 Structured approach in Python for generating and solving [Futoshiki](#) puzzles that performs significantly better than vanilla backtracking algorithms.

[Falcon Tree Illustrator](#) 2025 A Python codebase that illustrates step by step how block circulant matrices are recursively orthogonalized in quasilinear time and compactly represented as a Falcon tree.

SPECIAL ACHIEVEMENTS

2019 Recommended by AFSB Varanasi for NDA 138 with a final [merit list](#) rank of 147 among 500,000+ candidates.