APOORV VIKRAM SINGH

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EDUCATION

New York University, Tandon School of Engineering
Ph.D. Candidate in Computer Science Sept 2020 – Present
Advisor: Christopher Musco

International Institute of Information Technology, Bangalore
Bachelor and Master of Technology Aug 2013 – July 2018
Specialization: Theoretical Computer Science
Thesis: Clustering Perturbation Resilient Instances
Advisor: G. Srinivasaraghavan

EXPERIENCE

Visiting Researcher, INRIA Lille Oct 2019 – Jan 2020
MODAL Team, INRIA Lille, France
Advisor(s): Hemant Tyagi (INRIA), Mihai Cucuringu (Univ. of Oxford)

Project Associate, IISc Bangalore Aug 2018 – Aug 2019
Department of CSA, Indian Institute of Science (IISc)
Advisor(s): Anand Louis (IISc), Amit Deshpande (Microsoft Research)

Narendra Summer Intern, IISc Bangalore Summer 2017
Department of CSA, Indian Institute of Science
Advisor: Anand Louis

PUBLICATIONS ($\alpha - \beta$)

1. **Sharper Bounds for Chebyshev Moment Matching with Applications to Differential Privacy and Beyond**
(with Cameron Musco, Christopher Musco, and Lucas Rosenblatt)
Abstract at TPDP 2024, (Link)
2. **Faster Spectral Density Estimation and Sparsification in the Nuclear Norm**
(with Yujia Jin, Ishani Karmarkar, Christopher Musco, and Aaron Sidford)
COLT 2024, (Link)
3. **Moments, Random Walks, and Limits for Spectrum Approximation**
(with Yujia Jin, Christopher Musco, and Aaron Sidford)
COLT 2023, (Link)
4. **Regularized Spectral Methods for Clustering Signed Networks**
(with Mihai Cucuringu, Deborah Sulem, and Hemant Tyagi)
JMLR 2021, (Link)
5. **On Euclidean k-Means Clustering with α-Center Proximity**
(with Amit Deshpande, and Anand Louis)
AISTATS 2019, (Link)
6. **Approximation Algorithms for Cost-Balanced Clustering**
(with Amit Deshpande, Anand Louis, and Deval Patel)
Preprint 2019, (Link)

TEACHING

- **NYU CS-GY 3943: Graph Visualization Algorithms** Spring 2024
Grader and Teaching Assistant.
- **NYU CS-GY 6763: Algorithmic Machine Learning and Data Science** Fall 2023
Head Teaching Assistant: Recitation, Office Hours, and Grading.

- **E0306: Deep Learning, Theory and Practice** Spring 2019
  Grader for the course at IISc Bangalore
- **E0203: Spectral Algorithms** Spring 2018
  Grader for the course at IISc Bangalore

SERVICE

- **Program Committee**: Algorithmic Learning Theory (ALT) 2024, 2025.
- **External Reviewer**: FOCS 2022, STOC 2023, ICALP 2024, ESA 2024, APPROX 2024.

PRESENTATIONS (selected)

- Sharper Bounds for Chebyshev Moment Matching at Aaron Sidford's group meeting at Stanford 2024, and at NYC Graduate Student TCS Day 2024.
- Faster Spectral Density Estimation and Sparsification in the Nuclear Norm at COLT 2024.
- Moments, Random Walks, and Limits for Spectrum Approximation at DIMACS Rutgers, IISc Bangalore, COLT 2023, CS Theory Lunch Seminar at Stanford 2024, and at Brown CS Theory Seminar 2024.
- Reading Group Presentations on Discrepancy Theory, Kadison-Singer Problem, Second Moment Methods, and Sum of Squares Methods, and Counting Bases of Matroids.
- Euclidean k-Means with Center Proximity at ICTS-TIFR, INRIA Lille, IIIT Bangalore, and AISTATS 2019.

MISCELLANEOUS

- Received the COLT 2024 Travel Grant.
- Organizing a reading group on Extremal Graph Theory in Fall 2023.
- Lead a reading group on Probabilistic Combinatorics in Spring 2023.
- Selected for the 2022 summer school on **New tools for optimal mixing of Markov chains: Spectral independence and entropy decay**, organized at the University of California at Santa Barbara.
- Selected for the 2022 **Swedish Summer School on Theoretical Computer Science** organized by KTH.

RELEVANT COURSES

- Probability Theory
- Intro to Analysis 2
- Probabilistic Combinatorics
- Concentration of Measure
- Algorithmic ML & DS
- Bayesian ML
- Info Thy Methods in Stats
- Mathematical Statistics
- Rand Numerical LA