

Nikhil Shagrithaya

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EDUCATION	<i>PhD</i> , Computer Science University of Michigan, Ann Arbor Advisor: Prof. Mahdi Cheraghchi	2021-
	<i>Master of Science (by Research)</i> , Computer Science Indian Institute of Technology, Kanpur Advisor: Prof. Rajat Mittal	2018-21
	<i>Bachelor of Technology</i> , Communication & Computer Engineering The LNM Institute of Information Technology, Jaipur	2014-18
RESEARCH INTERESTS	Theoretical computer science, computational complexity, coding theory, analysis of Boolean functions.	
RESEARCH EXPERIENCE	<i>Master's Thesis under Prof. Rajat Mittal</i>	Jan 2019-Feb 2021
	<ul style="list-style-type: none">• Gave an alternate, dual-based proof of a result by Nisan and Szegedy, which showed a polynomial relation between sensitivity and approximate degree.• Designed and characterized the notion of approximate degree for derivatives of Boolean functions.	
	<i>Visiting Students' Research Program at TIFR under Prof. Arkadev Chattopadhyay</i>	May-Jul 2020
	<ul style="list-style-type: none">• Investigated various methods to construct a dual composition witnessing a tight lower bound for approximate degree.• Showed a simpler proof for a result on the approximate degree of block composed functions.	
TEACHING EXPERIENCE	IIT Kanpur <ul style="list-style-type: none">• TA for ESC101 (Introduction to Programming): Graded assignments and mid term papers.• TA for CS345 (Algorithms II): Graded assignments and quizzes.	
RELEVANT COURSEWORK	Graph Theory Quantum Computing Computational Complexity Theory Linear Programming and Applications Algorithmic Information Theory Advanced Graph Algorithms Randomness and Computation Introduction to Coding Theory	
TALKS, BLOG POSTS	Coursework Talks <ul style="list-style-type: none">• Projection-Free Sparse Convex Optimization.• Oracle Separation of BQP and PH.• PP is closed under intersection.	

SIGTACS Talks

- Certifiable randomness using quantum mechanical devices.
- Counterexamples to Hedetniemi's conjecture.

PROGRAMMING EXPERIENCE *Google Summer of Code under Mozilla Research* **May-Jul 2017**

- Optimized initial page load time in Servo (experimental browser engine) by distributing load across multiple threads.
- Implemented speculative parsing, to allow HTML parsing to continue alongside script execution.

CONFERENCES, WORKSHOPS

- FSTTCS 2019, IIT Bombay, Dec 2019.
- Workshop on Sensitivity, Query Complexity, Communication Complexity and Fourier Analysis of Boolean Functions, ISI Kolkata, Feb 2020.
- CCC 2020 (online).
- FOCS 2020 (online).
- STOC 2021 (online).
- DIMACS Workshop on Meta-Complexity, Barriers, and Derandomization, April 2022.