VIHAN SHAH

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EDUCATION

University of Waterloo   *September 2023 - Present*
PhD in Computer Science
Cheriton School of Computer Science
Advisor: Sepehr Assadi

Rutgers University   *September 2020 - September 2023*
PhD in Computer Science (Master's degree earned en route)
New Brunswick College of Arts and Sciences
Advisor: Sepehr Assadi

Rutgers University   *September 2019 - May 2020*
BA in Computer Science
Camden College of Arts and Sciences

Mahindra Ecole Centrale (MEC)   *August 2016 - May 2019*
Completed 3 years of B.Tech in Computer Science

RESEARCH INTERESTS

My research interest is in **theoretical computer science** and specifically in **streaming** algorithms. I have recently also worked on sublinear, dynamic, and learning-augmented algorithms. I generally enjoy working on **graph** problems in these settings.

CONFERENCE PAPERS

An Improved Fully Dynamic Algorithm for Counting 4-Cycles   *PODS 2025*
in General Graphs using Fast Matrix Multiplication
with Sepehr Assadi.

Fully Dynamic Adversarially Robust Correlation Clustering   *AISTATS 2025*
in Polylogarithmic Update Time
with Vladimir Braverman, Prathamesh Dharangutte, Shreyas Pai and Chen Wang.

Space Complexity of Minimum Cut Problems in Single-Pass Streams   *ITCS 2025*
with Matthew Ding, Alexandro Garces, Jason Li, Honghao Lin, Jelani Nelson,
and David Woodruff.

Learning-augmented Maximum Independent Set   *APPROX 2024*
with Vladimir Braverman, Prathamesh Dharangutte and Chen Wang.

New Lower Bounds in Merlin-Arthur Communication and   *ITCS 2024*
Graph Streaming Verification
with Prantar Ghosh

Streaming Algorithms and Lower Bounds for Estimating Correlation Clustering Cost
NeurIPS 2023
with Sepehr Assadi and Chen Wang

Tight Bounds for Vertex Connectivity in Dynamic Streams
SOSA 2023
with Sepehr Assadi

Generalizing Greenwald-Khanna Streaming Quantile Summaries for Weighted Inputs
ICDT 2023
with Sepehr Assadi, Nirmit Joshi and Milind Prabhu

Space Optimal Vertex Cover in Dynamic Streams
APPROX 2022
with Kheeran K. Naidu

An Asymptotically Optimal Algorithm for Maximum Matching in Dynamic Streams
ITCS 2022
with Sepehr Assadi

HONORS AND AWARDS

NeurIPS Scholar Award
October 2023

TALKS

Young Researcher Seminar Series, Toyota Technological Institute at Chicago
April 2025

Seminar Talk, University of Waterloo
March 2025

Seminar Talk, Dartmouth College
January 2025

Reading Group Presentation, Rutgers University
June 2024

EXTERNAL REVIEWER

Symposium on Theory of Computing (STOC)
2022, 2024, 2025

Symposium on Foundations of Computer Science (FOCS)
2025

Symposium on Discrete Algorithms (SODA)
2022, 2023, 2024

Innovations in Theoretical Computer Science (ITCS)
2024, 2025

Symposium on Principles of Database Systems (PODS)
2025

European Symposium on Algorithms (ESA)
2022, 2023, 2024

International Colloquium on Automata, Languages, and Programming (ICALP) *2023,2025*

Symposium on Principles of Distributed Computing (PODC)
2021

TEACHING AND MENTORING

Directed Reading Program (DRP) Mentor for Women in Mathematics (WiM) at University of Waterloo *Winter 24*

Research Experiences for Undergraduates (REU) Mentor along with my advisor Sepehr Assadi at Rutgers University/DIMACS *Summer 23*

Guest Lectures on Sublinear and Streaming Algorithms at PACT (Program in Algorithmic and Combinatorial Thinking) in Princeton University *Summer 20, 21, 22, 23, 24*

Guest Lecture, Randomized Algorithms (CS 761) at the University of Waterloo *Winter 2025*

Teaching Assistant for Design and Analysis of Computer Algorithms (CS 344) at Rutgers University *Spring 21, 22, Fall 21*

Teaching Assistant for Introduction to Discrete Structures (CS 205) at Rutgers University *Fall 20, Summer 21*

Teaching Assistant for Discrete Mathematics at PACT *Summer 19*

REFERENCES

Dr. Sepehr Assadi
Associate Professor, Faculty of Mathematics Research Chair
University of Waterloo
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Dr. Christian Konrad
Senior Lecturer
University of Bristol
Email: christian.konrad@bristol.ac.uk

Dr. Prantar Ghosh
Assistant Professor
Tennessee Tech University
Email: pghosh@tntech.edu