Sepehr Assadi

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Personal Data

PROFESSIONAL EXPERIENCE

◇ **Associate Professor** July 2023 to present
University of Waterloo, Cheriton School of Computer Science
Faculty of Mathematics Research Chair

◇ **Assistant Professor** September 2019 to present
Rutgers University, Department of Computer Science

◇ **Postdoctoral Researcher** January 2019 to August 2019
Princeton University, Department of Computer Science
Supported by the Simons Collaboration on Algorithms and Geometry

◇ **Summer Intern** June 2017 to August 2017
Google Research (NYC), Algorithms & Optimization team

EDUCATION

◇ **PhD in Computer and Information Science**, August 2013 to December 2018
University of Pennsylvania, Department of Computer and Information Science

- *Advisor*: Sanjeev Khanna
- *Thesis*: Combinatorial Optimization on Massive Datasets: Streaming, Distributed, and Massively Parallel Computation
  - ∗ *EATCS Distinguished Dissertation Award*
  - ∗ *ACM-EATCS Principles of Distributed Computing Doctoral Dissertation Award*
  - ∗ *Rubinoff Dissertation Award from University of Pennsylvania*

◇ **B.Sc. in Computer Engineering**, September 2008 to July 2013
Sharif University of Technology, Department of Computer Engineering

- *Thesis*: The Rectangle Escape Problem
- *Thesis supervisor*: Hamid Zarrabi-Zadeh

HONORS AND AWARDS

◇ **Alfred P. Sloan Research Fellowship**, 2023.
◇ **Faculty of Mathematics Research Chair**, University of Waterloo, 2023.
◇ **Individual Fulcrum Award** from Rutgers Research Council, 2022.
◇ **Google Research Scholar Program Award**, 2021.
◇ National Science Foundation **Faculty Early Career Development (CAREER) Award**, 2020.
◇ **Best Paper Award** at International Symposium on Distributed Computing, DISC 2020.
◇ ACM-EATCS Principles of Distributed Computing **Doctoral Dissertation Award**, 2019.
◇ EATCS **Distinguished Dissertation Award**, 2019.
◇ **Rubinoff Dissertation Award**, University of Pennsylvania, 2019.
◇ **Best Paper Award** at Symposium on Discrete Algorithms, SODA 2019.

- ◇ **Best Paper Award** at Symposium on Parallelism in Algorithms and Architectures, SPAA 2017.
- ◇ **Best Student Paper Award** at Symposium on Principles of Database Systems, PODS 2017.
- ◇ **Best Paper Award** at Conference on Web and Internet Economics, WINE 2015.
- ◇ **Ranked 8^{th}** in the Asia Regional ACM-ICPC Contest, Tehran, Iran, 2012.
- ◇ **Gold Medal** in the Scientific Olympiad for University Students in Computer Science, Iran, 2012.
- ◇ **Ranked 10^{th}** in National Entrance Exam for M.Sc in Computer Science, Iran, 2010.

Research and Scholarship

Research Interests

My research interest is in theoretical computer science, primarily algorithm design and complexity theory for modern models of computation. Most of my work is on **sublinear algorithms and lower bounds** in various models for processing massive datasets such as streaming, distributed, massively parallel, and sublinear time algorithms. More broadly, I am also interested in algorithmic graph theory, communication complexity, online algorithms, and algorithmic game theory.

Summary of Publications

Metrics: According to Google Scholar, as of August 2023, my papers have been cited over 1600 times and my h-index is 23.

Primary publication venues: Conferences: *STOC, FOCS, SODA*; Journals: *SICOMP*.
In theoretical computer science, the most important venues of publications are conferences and not journals. *STOC* and *FOCS* are widely recognized as the most prestigious conferences in the field worldwide, followed by *SODA* which is the top conference dedicated to algorithm design.

Lifetime summary of publications: The table lists all my publications starting from 2012:

	Submitted	Published
Conference papers	1	70[†]
Journal papers	3	8[*]
Editorial notes, etc.	1	3
Total	5	81
Keynotes		1
Invited talks at Workshops		16
Seminars and Colloquia		21
Conference talks		15
Total		53

[†]Among these, 4 conference papers received a **best paper award**, 1 received a **best student paper award**, 9 were **invited to the special issue** of corresponding journals (SICOMP, TALG, TEAC, and Algorithmica), and 3 were invited to **Highlights of Algorithms (HALG)** conference as one of the top results in the area in that year.
[*]Among these, 7 papers were **invited to the special issue** as one of the few best papers published in their corresponding conferences.

Publications

In the following, as is the convention in theoretical computer science (TCS), all authorships are in alphabetical order with a few exception that are outside TCS and are marked explicitly.

Journals:

[10] *Brooks' Theorem in Graph Streams: A Single-Pass Semi-Streaming Algorithm for Δ-Coloring*
S. Assadi, P. Kumar, P. Mittal
TheoretiCS Journal, 2023

[9] *Improved Truthful Mechanisms for Combinatorial Auctions with Submodular Bidders*
S. Assadi, S. Singla
SIAM journal on Computing (SICOMP), 2022
Invited paper in the **special issue** for FOCS 2019 papers

[8] *Separating the Communication Complexity of Truthful and Non-Truthful Combinatorial Auctions*
S. Assadi, H. Khandeparkar, R. Saxena, M. Weinberg
SIAM journal on Computing (SICOMP), 2022
Invited paper in the **special issue** for STOC 2020 papers

[7] *Tight Bounds for Single-Pass Streaming Complexity of the Set Cover Problem*
S. Assadi, S. Khanna, Y. Li
SIAM journal on Computing (SICOMP), 2021
Invited paper in the **special issue** for STOC 2016 papers

[6] *Combinatorial Auctions Do Need Modest Interaction*
S. Assadi
ACM Transactions on Economics and Computation (TEAC), 2020
Invited paper in the **special issue** for EC 2017 papers

[5] *The Stochastic Matching Problem with (Very) Few Queries*
S. Assadi, S. Khanna, Y. Li
ACM Transactions on Economics and Computation (TEAC), 2019
Invited paper in the **special issue** for EC 2016 papers

[4] *Fast Convergence in the Double Oral Auction*
S. Assadi, S. Khanna, Y. Li, R. Vohra
ACM Transactions on Economics and Computation (TEAC), 2018
Invited paper in the **special issue** for WINE 2015 and EC 2016 papers

[3] *On the Rectangle Escape Problem*
A. Ahmadinejad, S. Assadi, E. Emamjomeh-Zadeh, S. Yazdanbod, H. Zarrabi-Zadeh
Theoretical Computer Science (TCS), 2017

[2] *A Compile-Time Optimization Method for WCET Reduction in Real-Time Embedded Systems through Block Formation*
M. Mohajjel, M. Taram, S. Assadi, A. Ejlali (* in contribution order)
ACM Transactions on Architecture and Code Optimization (TACO), 2016

[1] *The Minimum Vulnerability Problem*
S. Assadi, E. Emamjomeh-Zadeh, A. Norouzi-Fard, S. Yazdanbod, H. Zarrabi-Zadeh
Algorithmica, 2014
Invited paper in the **special issue** for ISAAC 2012 papers

Conferences:

[70] *Hidden Permutations to the Rescue: Multi-Pass Semi-Streaming Lower Bounds for Approximate Matchings*
S. Assadi, J. Sundaresan
64th IEEE Symposium on Foundations of Computer Science, **FOCS 2023**

[69] *Evaluating Stability in Massive Social Networks: Efficient Streaming Algorithms for Structural Balance*
V. Ashvinkumar, S. Assadi, C. Deng, J. Gao, C. Wang
Approximation, Randomization, and Combinatorial Optimization, **RANDOM 2023**

[68] *On Constructing Spanners from Random Gaussian Projections*
S. Assadi, M. Kapralov, H. Yu
Approximation, Randomization, and Combinatorial Optimization, **RANDOM 2023**

[67] *Fine-Grained Buy-Many Mechanisms Are Not Much Better Than Bundling*
S. Assadi, V. Kher, G. Li, A. Schvartzman
24th ACM Conference on Economics and Computation, **EC 2023**

[66] *Coloring in Graph Streams via Deterministic and Adversarially Robust Algorithms*
S. Assadi, A. Chakrabarti, P. Ghosh, M. Stoeckl
Symposium on Principles of Database Systems, **PODS 2023**

[65] *(Noisy) Gap Cycle Counting Strikes Back: Random Order Streaming Lower Bounds for Connected Components and Beyond*
S. Assadi, J. Sundaresan
55th ACM Symposium on Theory of Computing, **STOC 2023**

[64] *On Regularity Lemma and Barriers in Streaming and Dynamic Matching*
S. Assadi, S. Behnezhad, S. Khanna, H. Li
55th ACM Symposium on Theory of Computing, **STOC 2023**

[63] *All-Norm Load Balancing in Graph Streams via the Multiplicative Weights Update Method*
S. Assadi, A. Bernstein, Z. Langley
The 14th Innovations in Theoretical Computer Science, **ITCS 2023**

[62] *Tight Bounds for Monotone Minimal Perfect Hashing*
S. Assadi, M. Farach-Colton, W. Kuzmaul
The 34th Annual ACM-SIAM Symposium on Discrete Algorithms, **SODA 2023**
Invited to **TALG special issue** for SODA 2023 papers

[61] *Tight Bounds for Vertex Connectivity in Dynamic Streams*
S. Assadi, V. Shah
The SIAM Symposium on Simplicity in Algorithms, **SOSA 2023**

[60] *Generalizing Greenwald-Khanna Streaming Quantile Summaries for Weighted Inputs*
S. Assadi, N. Joshi, M. Prabhu, V. Shah
26th International Conference on Database Theory, **ICDT 2023**

[59] *Single-pass Streaming Lower Bounds for Multi-armed Bandits Exploration with Instance-sensitive Sample Complexity*
S. Assadi, C. Wang

36rd Conference on Neural Information Processing Systems, **NeurIPS 2022**

[58] *Rounds vs Communication Tradeoffs for Maximal Independent Sets*
S. Assadi, G. Kol, Z. Zhang
The 63rd IEEE Symposium on Foundations of Computer Science, **FOCS 2022**
Invited to **SICOMP special issue** for FOCS 2022 papers

[57] *Asymptotically Optimal Bounds for Estimating H-Index in Sublinear Time with Applications to Subgraph Counting*
S. Assadi, H. Nguyen
Approximation, Randomization, and Combinatorial Optimization, **APPROX 2022**

[56] *Hierarchical Clustering in Graph Streams: Single-Pass Algorithms and Space Lower Bounds*
S. Assadi, V. Chatziafratis, J. Lacki, V. Mirrokni, C. Wang
35th Annual Conference on Learning Theory, **COLT 2022**

[55] *Decremental Matching in General Graphs*
S. Assadi, A. Bernstein, A. Dudeja
49th International Colloquium on Automata, Languages and Programming, **ICALP 2022**

[54] *Deterministic Graph Coloring in the Streaming Model*
S. Assadi, A. Chen, G. Sun
54th ACM Symposium on Theory of Computing, **STOC 2022**

[53] *Brooks' Theorem in Graph Streams: A Single-Pass Semi-Streaming Algorithm for Δ-Coloring*
S. Assadi, P. Kumar, P. Mittal
54th ACM Symposium on Theory of Computing, **STOC 2022**

[52] *SPINE: Scaling up Programming-by-Negative-Example for String Filtering and Transformation*
C. Zuo, S. Assadi, D. Deng (* in contribution order)
ACM International Conference on Management of Data, **SIGMOD 2022**

[51] *An Asymptotically Optimal Algorithm for Maximum Matching in Dynamic Streams*
S. Assadi, V. Shah
The 13th Innovations in Theoretical Computer Science, **ITCS 2022**

[50] *Sublinear Time and Space Algorithms for Correlation Clustering via Sparse-Dense Decompositions*
S. Assadi, C. Wang
The 13th Innovations in Theoretical Computer Science, **ITCS 2022**

[49] *A Two-Pass (Conditional) Lower Bound for Semi-Streaming Maximum Matching*
S. Assadi
The 33rd Annual ACM-SIAM Symposium on Discrete Algorithms, **SODA 2022**

[48] *Semi-Streaming Bipartite Matching in Fewer Passes and Optimal Space*
S. Assadi, A. Jambulapati, Y. Jin, A. Sidford, K. Tian
The 33rd Annual ACM-SIAM Symposium on Discrete Algorithms, **SODA 2022**

[47] *Ruling Sets in Random Order and Adversarial Streams*
S. Assadi, A. Dudeja
International Symposium on Distributed Computing, **DISC 2021**

[46] *On the Robust Communication Complexity of Bipartite Matching*
S. Assadi, S. Behnezhad
Approximation, Randomization, and Combinatorial Optimization, **RANDOM 2021**

[45] *Graph Connectivity and Single Element Recovery via Linear and OR Queries*
S. Assadi, D. Chakrabarty, S. Khanna
European Symposium on Algorithms, **ESA 2021**

[44] *Fully Dynamic Set Cover via Hypergraph Maximal Matching: An Optimal Approximation Through a Local Approach*
S. Assadi, S. Solomon
European Symposium on Algorithms, **ESA 2021**

[43] *Beating Two-Thirds for Random-Order Streaming Matching*
S. Assadi, S. Behnezhad
48th International Colloquium on Automata, Languages and Programming, **ICALP 2021**

[42] *Graph Streaming Lower Bounds for Parameter Estimation and Property Testing via a Streaming XOR Lemma*
S. Assadi, V. N
53rd ACM Symposium on Theory of Computing, **STOC 2021**

[41] *Improved Truthful Mechanisms for Subadditive Combinatorial Auctions: Breaking the Logarithmic Barrier*
S. Assadi, T. Kesselheim, S. Singla
The 32nd Annual ACM-SIAM Symposium on Discrete Algorithms, **SODA 2021**

[40] *A Simple Semi-Streaming Algorithm for Global Minimum Cuts*
S. Assadi, A. Dudeja
The SIAM Symposium on Simplicity in Algorithms, **SOSA 2021**

[39] *An Auction Algorithm for Bipartite Matching in Streaming and Massively Parallel Computation Models*
S. Assadi, C. Liu, R. Tarjan
The SIAM Symposium on Simplicity in Algorithms, **SOSA 2021**

[38] *Near-Quadratic Lower Bounds for Two-Pass Graph Streaming Algorithms*
S. Assadi, R. Raz
The 61st IEEE Symposium on Foundations of Computer Science, **FOCS 2020**

[37] *Multi-Pass Graph Streaming Lower Bounds for Cycle Counting, MAX-CUT, Matching Size, and Other Problems*
S. Assadi, G. Kol, R. Saxena, H. Yu
The 61st IEEE Symposium on Foundations of Computer Science, **FOCS 2020**

[36] *Improved Bounds for Distributed Load Balancing*
S. Assadi, A. Bernstein, Z. Langley
International Symposium on Distributed Computing, **DISC 2020**
Best Paper Award

[35] *Palette Sparsification Beyond* $(\Delta + 1)$ *Vertex Coloring*
N. Alon, S. Assadi
Approximation, Randomization, and Combinatorial Optimization, **RANDOM 2020**

[34] *Lower Bounds for Distributed Sketching of Maximal Matchings and Maximal Independent Sets*
S. Assadi, G. Kol, R. Oshman
ACM Symposium on Principles of Distributed Computing, **PODC 2020**

[33] *Exploration with Limited Memory: Streaming Algorithms for Coin Tossing, Noisy Comparisons, and Multi-Armed Bandits*
S. Assadi, C. Wang
52nd ACM Symposium on Theory of Computing, **STOC 2020**

[32] *Separating the Communication Complexity of Truthful and Non-Truthful Combinatorial Auctions*
S. Assadi, H. Khandeparkar, R. Saxena, M. Weinberg
52nd ACM Symposium on Theory of Computing, **STOC 2020**
Invited to **SICOMP special issue** for STOC 2020 papers

[31] *Improved Truthful Mechanisms for Combinatorial Auctions with Submodular Bidders*
S. Assadi, S. Singla
60th Annual IEEE Symposium on Foundations of Computer Science, **FOCS 2019**
Invited to **SICOMP special issue** for FOCS 2019 papers
Invited to **Highlights Beyond EC** in EC'20
Invited research article in **SIGecom Exchanges**

[30] *Secretary Ranking with Minimal Inversions*
S. Assadi, E. Balkanski, R. Paes Leme
33rd Conference on Neural Information Processing Systems, **NeurIPS 2019**

[29] *Massively Parallel Algorithms for Finding Well-Connected Components*
S. Assadi, X. Sun, O. Weinstein
ACM Symposium on Principles of Distributed Computing, **PODC 2019**

[28] *Distributed Weighted Matching via Randomized Composable Coresets*
S. Assadi, M. Bateni, V. Mirrokni
36th International Conference on Machine Learning, **ICML 2019**

[27] *When Algorithms for Maximal Independent Set and Maximal Matching Run in Sublinear Time*
S. Assadi, S. Solomon.
46th International Colloquium on Automata, Languages and Programming, **ICALP 2019**

[26] *Distributed and Streaming Linear Programming in Low Dimensions*
S. Assadi, N. Karpov, Q. Zhang.
38th Annual ACM Symposium on Principles of Database Systems, **PODS 2019**
Invited to **TODS special issue** for PODS 2019 papers

[25] *Polynomial Pass Lower Bounds for Graph Streaming Algorithms*
S. Assadi, Y. Chen, S. Khanna.
51st ACM Symposium on Theory of Computing, **STOC 2019**

[24] *A Simple Sublinear-Time Algorithm for Counting Arbitrary Subgraphs via Edge Sampling*
S. Assadi, M. Kapralov, S. Khanna.
10th Innovations in Theoretical Computer Science, **ITCS 2019**
Invited Talk at **TCS+**

[23] *Sublinear Algorithms for* $(\Delta + 1)$ *Vertex Coloring*
S. Assadi, Y. Chen, S. Khanna.

30th Annual ACM-SIAM Symposium on Discrete Algorithms, **SODA 2019**
Best Paper Award
Invited to Highlights of Algorithms, **HALG 2020**

[22] *Coresets Meet EDCS: Algorithms for Matching and Vertex Cover on Massive Graphs*
S. Assadi, M. Bateni, A. Bernstein, V. Mirrokni, C. Stein
30th Annual ACM-SIAM Symposium on Discrete Algorithms, **SODA 2019**

[21] *Fully Dynamic Maximal Independent Set with Sublinear in n Update Time*
S. Assadi, K. Onak, B. Schieber, S. Solomon.
30th Annual ACM-SIAM Symposium on Discrete Algorithms, **SODA 2019**

[20] *Stochastic Submodular Cover with Limited Adaptivity*
A. Agarwal, S.Assadi, S. Khanna.
30th Annual ACM-SIAM Symposium on Discrete Algorithms, **SODA 2019**

[19] *Towards a Unified Theory of Sparsification for Matching Problems*
S. Assadi, A. Bernstein.
2nd Symposium on Simplicity in Algorithms, **SOSA 2019**

[18] *Fully Dynamic Maximal Independent Set with Sublinear Update Time*
S. Assadi, K. Onak, B. Schieber, S. Solomon.
50th Annual ACM Symposium on the Theory of Computing, **STOC 2018**

[17] *Tight Bounds on the Round Complexity of the Distributed Maximum Coverage Problem*
S. Assadi, S. Khanna.
29th Annual ACM-SIAM Symposium on Discrete Algorithms, **SODA 2018**

[16] *Randomized Composable Coreset for Matching and Vertex Cover*
S. Assadi, S. Khanna
29th Annual ACM Symposium on Parallelism in Algorithms and Architectures, **SPAA 2017**
Best Paper Award (co-winner)
Invited to Highlights of Algorithms, **HALG 2018**

[15] *Learning with Limited Rounds of Adaptivity: Coin Tossing, Multi-Armed Bandits, and Ranking from Pairwise Comparisons*
A. Agarwal, S. Agarwal, S. Assadi, S. Khanna
30th Annual Conference on Learning Theory, **COLT 2017**

[14] *Combinatorial Auctions Do Need Modest Interaction*
S. Assadi
18th ACM Conference on Economics and Computation, **EC 2017**
Invited to **TEAC special issue** for EC 2017 papers

[13] *The Stochastic Matching Problem: Beating Half with a Non-Adaptive Algorithm*
S. Assadi, S. Khanna, Y. Li
18th ACM Conference on Economics and Computation, **EC 2017**

[12] *Tight Space-Approximation Tradeoff for the Multi-Pass Streaming Set Cover Problem*
S. Assadi
36th Annual ACM Symposium on Principles of Database Systems, **PODS 2017**
Best Student Paper Award

[11] *On Estimating Maximum Matching Size in Graph Streams*
S. Assadi, S. Khanna, Y. Li
28th Annual ACM-SIAM Symposium on Discrete Algorithms, **SODA 2017**
Invited to Highlights of Algorithms, **HALG 2017**

[10] *Tight Bounds for Single-Pass Streaming Complexity of the Set Cover Problem*
S. Assadi, S. Khanna, Y. Li
48th Annual Symposium on the Theory of Computing, **STOC 2016**
Invited to **SICOMP special issue** for STOC 2016 papers

[9] *The Stochastic Matching Problem With (Very) Few Queries*
S. Assadi, S. Khanna, Y. Li
17th ACM Conference on Economics and Computation, **EC 2016**
Invited to **TEAC special issue** for EC 2016 papers

[8] *Algorithms for Provisioning Queries and Analytics*
S. Assadi, S. Khanna, Y. Li, V. Tannen
19th International Conference on Database Theory, **ICDT 2016**

[7] *Maximum Matchings in Dynamic Graph Streams and the Simultaneous Communication Model*
S. Assadi, S. Khanna, Y. Li, G. Yaroslavtsev
27th Annual ACM-SIAM Symposium on Discrete Algorithms, **SODA 2016**

[6] *Dynamic Sketching for Graph Optimization Problems with Applications to Cut-Preserving Sketches*
S. Assadi, S. Khanna, Y. Li, V. Tannen
35th IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science, **FSTTCS 2015**

[5] *Fast Convergence in the Double Oral Auction*
S. Assadi, S. Khanna, Y. Li, R. Vohra
11th Conference on Web and Internet Economics, **WINE 2015**
Best Paper Award
Invited to **TEAC special issue** for WINE 2015 and EC 2016 papers

[4] *Online Assignment of Heterogeneous Tasks in Crowdsourcing Markets*
S. Assadi, J. Hsu, S. Jabbari
3rd AAAI Conference on Human Computation & Crowdsourcing, **HCOMP 2015**

[3] *Complexity of the Minimum Input Selection Problem for Structural Controllability*
S. Assadi, S. Khanna, Y. Li, V. Preciado
5th IFAC Workshop on Distributed Estimation and Control in Networked Systems, **NecSys 2015**

[2] *On The Rectangle Escape Problem*
S. Assadi, E. Emamjomeh-Zadeh, S. Yazdanbod, H. Zarrabi-Zadeh
25th Canadian Conference on Computational Geometry, **CCCG 2013**

[1] *The Minimum Vulnerability Problem*
S. Assadi, E. Emamjomeh-Zadeh, A. Norouzi-Fard, S. Yazdanbod, H. Zarrabi-Zadeh
23rd International Symposium on Algorithms and Computation, **ISAAC 2012**
Invited to **Algorithmica special issue** for ISAAC 2012 papers

Invited Talks

Keynotes:

[1] 36th International Symposium on Distributed Computing (DISC 2022) October 2022
Keynote: Graph Coloring, Palette Sparsification, and Beyond

Workshops and Other Events:

[16] DIMACS Workshop on Modern Techniques in Graph Algorithms June 2023
Tutorial: Ruzsa-Szemerédi Graphs and their Applications

[15] Highlights of Algorithms Conference June 2023
Survey: Lower Bound Techniques for Multi-Pass Streaming Algorithms

[14] Sublinear Workshop at EPFL Bernoulli Center December 2022
A (Slightly) Sublinear Space Streaming Algorithm for Matchings

[13] Workshop on Advances in Distributed Graph Algorithms (ADGA) October 2022
Lower Bounds for Distributed Sketching

[12] Simons-DIMACS Workshop on Lower Bounds and Frontiers in Data Structures August 2022
Tight Bounds for Monotone Minimal Perfect Hashing

[11] FODSI Workshop on Sublinear Algorithms August 2022
A (Slightly) Sublinear Space Streaming Algorithm for Matchings

[10] Banff Workshop on Communication Complexity and Applications III July 2022
Recent Advances in Multi-Pass Graph Streaming Lower Bounds

[9] Workshop on Algorithms and Foundations for Data Science June 2022
Brooks' Theorem in Graph Streams

[8] Workshop on Algorithms for Large Data (Online), WALDO 2021 August 2021
Multi-Pass Graph Streaming Lower Bounds for Parameter Estimation and Property Testing Problems

[7] INFORMS Session on Bandits Meet Optimization November 2020
Exploration with Limited Memory: Streaming Algorithms for Multi-Armed Bandits

[6] Highlights of Algorithms Conference August 2020
Sublinear Algorithms for $(\Delta + 1)$ *Vertex Coloring*

[5] New York Area Theory Day May 2019
Sublinear Algorithms for $(\Delta + 1)$ *Vertex Coloring*

[4] TCS+ Online Seminar February 2019
A Simple Sublinear-Time Algorithm for Counting Arbitrary Subgraphs via Edge Sampling

[3] Simons Institute meeting on Algorithms and Geometry Collaboration February 2019
Sublinear Algorithms for $(\Delta + 1)$ *Vertex Coloring*

[2] Simons Institute workshop on Sublinear Algorithms and Nearest-Neighbor Search November 2018
Sublinear Algorithms for $(\Delta + 1)$ *Vertex Coloring*

[1] Linear Sketching as a Tool for Everything workshop at FOCS'17 October 2017
Lower Bounds for Linear Sketches of Approximate Matchings and Matrix Rank

Seminars and Colloquia:

[21] UPenn CS Theory Seminar March 2023
An Asymptotically Optimal Algorithm for Maximum Matching in Dynamic Streams

[20] Harvard Theory of Computation Seminar March 2023
A (Slightly) Sublinear Space Streaming Algorithm for Matchings

[19] NYU Theory Seminar September 2022
Deterministic Graph Coloring in the Streaming Model

[18] MIT Algorithms and Complexity Seminar March 2022
Deterministic Graph Coloring in the Streaming Model

[17] Rutgers Discrete Math Seminar October 2021
Palette Sparsification for Vertex Coloring

[16] University of Washington Theory Seminar March 2021
Multi-Pass Graph Streaming Lower Bounds for Parameter Estimation and Property Testing

[15] Rutgers/DIMACS Theory Seminar September 2019
Improved Truthful Mechanisms for Combinatorial Auctions with Submodular Bidders

[14] MIT Theory of Computation Colloquium May 2019
Sublinear Algorithms for $(\Delta + 1)$ *Vertex Coloring*

[13] Cornell CS Theory Seminar May 2019
Sublinear Algorithms for $(\Delta + 1)$ *Vertex Coloring*

[12] Google NYC Research Seminar April 2019
Sublinear Algorithms for $(\Delta + 1)$ *Vertex Coloring*

[11] Princeton Theory Seminar April 2019
Polynomial Pass Lower Bounds in Graph Streams

[10] Rutgers/DIMACS Theory Seminar March 2019
Polynomial Pass Lower Bounds in Graph Streams

[9] Indiana Theory Seminar November 2017
Tight Bounds on the Round Complexity of the Distributed Maximum Coverage Problem

[8] Columbia Theory Seminar October 2017
Tight Bounds on the Round Complexity of the Distributed Maximum Coverage Problem

[7] IBM Watson Research Seminar September 2017
Randomized Composable Coreset for Matching and Vertex Cover

[6] Google NYC Research Seminar July 2017
Learning with Limited Rounds of Adaptivity

[5] Upenn Theory Seminar April 2017
Combinatorial Auctions Do Need Modest Interaction

[4] Johns Hopkins Algorithms and Complexity Seminar April 2017
Matching Size and Matrix Rank Estimation in Data Streams

[3] Google NYC Research Seminar November 2016
Tight Bounds for Single-Pass Streaming Complexity of the Set Cover Problem

[2] Columbia Theory Seminar January 2016
Tight Bounds for Linear Sketches of Approximate Matchings

[1] Upenn Theory Seminar January 2016
Tight Bounds for Linear Sketches of Approximate Matchings

Conference Talks:

[16] ACM-SIAM Symposium on Discrete Algorithms (SODA'22) January 2022
A Two-Pass (Conditional) Lower Bound for Semi-Streaming Maximum Matching

[15] RANDOM: The Conference (RANDOM'21) August 2021
On the Robust Communication Complexity of Bipartite Matching

[14] RANDOM: The Conference (RANDOM'20) August 2020
Palette Sparsification Beyond $(\Delta + 1)$ *Vertex Coloring*

[13] ACM Symposium on Principles of Distributed Computing (PODC'20) August 2020
Lower Bounds for Distributed Sketching of Maximal Matchings and Maximal Independent Sets

[12] Innovations in Theoretical Computer Science (ITCS'19) January 2019
A Simple Sublinear-Time Algorithm for Counting Arbitrary Subgraphs via Edge Sampling

[11] ACM-SIAM Symposium on Discrete Algorithms (SODA'19) January 2019
Sublinear Algorithms for $(\Delta + 1)$ *Vertex Coloring*

[10] ACM-SIAM Symposium on Discrete Algorithms (SODA'19) January 2019
Coresets Meet EDCS: Algorithms for Matching and Vertex Cover on Massive Graphs

[9] SIAM Symposium on Simplicity in Algorithms (SOSA'19) January 2019
Towards a Unified Theory of Sparsification for Matching Problems

[8] ACM Symposium on the Theory of Computing (STOC'18) June 2018
Fully Dynamic Maximal Independent Set with Sublinear Update Time

[7] ACM-SIAM Symposium on Discrete Algorithms (SODA'18) January 2018
Tight Bounds on the Round Complexity of the Distributed Maximum Coverage Problem

[6] ACM Symposium on Parallelism in Algorithms and Architectures (SPAA'17) July 2017
Randomized Composable Coreset for Matching and Vertex Cover

[5] ACM Conference on Economics and Computation (EC'17) July 2017
Combinatorial Auctions Do Need Modest Interaction

[4] ACM Conference on Economics and Computation (EC'17) July 2017
The Stochastic Matching Problem: Beating Half with a Non-Adaptive Algorithm

[3] ACM Symposium on Principles of Database Systems (PODS'17) May 2017
Tight Space-Approximation Tradeoff for the Multi-Pass Streaming Set Cover Problem

[2] ACM Symposium on the Theory of Computing (STOC'16) June 2016
Tight Bounds for Single-Pass Streaming Complexity of the Set Cover Problem

[1] ACM-SIAM Symposium on Discrete Algorithms (SODA'16) January 2016
Maximum Matchings in Dynamic Graph Streams and the Simultaneous Communication Model

RESEARCH FUNDING

- ◇ Alfred P. Sloan Research Fellowship: $75,000 USD, September 2023
- ◇ Waterloo Faculty of Mathematics Research Chair research grant: $250,000 CAD, July 2023
- ◇ Waterloo startup grant: $150,000 CAD, August 2022
- ◇ Rutgers Individual Fulcrum Award: $5,000 USD, August 2022
- ◇ Google Research Scholar Program Award: $60,000 USD, March 2021
- ◇ National Science Foundation (NSF) CAREER award CCF-2047061: $558,159 USD, February 2021
- ◇ Rutgers startup grant: $90,000 USD, September 2019

Teaching Activities

TEACHING

The curriculum for all these courses, including the undergraduate ones, have been designed and developed by myself. I have also received the *"Open and Affordable Textbook Program Award"* from the Rutgers University Libraries for curriculum development in my undergraduate course including preparation of detailed lecture notes tailored to the backgrounds of students at Rutgers.

- ◇ **Design and Analysis of Computer Algorithms** (undergraduate, 150 to 200 students)
  - CS 344 – Rutgers University (Fall 2019, Spring 2021, Spring 2022, Spring 2023)
  - Course website: https://sepehr.assadi.info/courses/cs344-s23/
- ◇ **Linear Programming** (graduate, 40 students)
  - CS 521 – Rutgers University (Fall 2022)
  - Course website: https://sepehr.assadi.info/courses/cs521-f22/
- ◇ **Design and Analysis Of Data Structures And Algorithms II** (graduate, 20 students)
  - CS 514 – Rutgers University (Spring 2020, Fall 2021)
  - Course website: https://sepehr.assadi.info/courses/cs514-f21/
- ◇ **Graph Streaming Algorithms and Lower Bounds** (graduate seminar, 10 students)

- CS 671 – Rutgers University (Fall 2020)
- Course website: https://sepehr.assadi.info/courses/cs671-f20.html

SUPERVISION

Lifetime summary of supervision: The table includes the list of all graduate students (Masters and PhD), postdoctoral research fellows (PDF), and undergraduate research assistant (RAs) that I have (co-)supervised:

	Supervised	Co-Supervised
Current Masters	0	0
Graduated Masters	1	0
Current PhD	4	0
Graduated PhD	0	0
Current PDF	1	1
Completed PDF	0	2
RAs	15	0

◇ **Postdocs at Rutgers/DIMACS**:

- Ariel Schvartzman Cohenca (DIMACS postdoc, 2020 to 2022; now at Google Research)
- Nicole Wein (DIMACS postdoc, 2021; now an Assistant Professor at University of Michigan)
- Zihan Tan (DIMACS postdoc, 2022 – present)
- Prantar Ghosh (DIMACS postdocs, 2022 – present)

◇ **PhD Students at Rutgers**:

- Chen Wang (2019 – present; expected graduation Winter 2024)
- Vihan Shah (2020 – present; expected graduation Spring 2025)
- Janani Sundaresan (2021 – present; expected graduation Winter 2026)
- Parth Mittal (2021 – present; expected graduation Spring 2026)

◇ **Master Students at Rutgers**:

- Chaitanya Nalam (2020 – 2021, now a PhD student at University of Michigan)

◇ **Undergraduate Thesis Advisor at Rutgers**:

- Hoai-an Nguyen (2021 – 2023, now a PhD student at CMU);
  - Hoai-an's undergraduate thesis was a winner of *Henry Rutgers Scholar Award* for "outstanding independent research projects leading to a thesis in their major field".
- Sanjana Pendharkar (2020 – 2021)

◇ **Other Undergraduate Students at Rutgers**:

- Polina Kochetova (2020, now a PhD student at Simon Fraser University)
- Vihan Shah (2020, now a PhD student at Rutgers)
- Manel Bermad (2020)
- Jakob Degen (2020)
- Arwa El-Hawwat (2019, now a MSc student at Rutgers)

◇ **DIMACS REU Students**:

- Alexandro (Alex) Garces (2023, MIT)
- Liubov (Luba) Samborska (2022, Yale, now a PhD student at University of Michigan)
- Glenn Sun (2021, UCLA, now a PhD student and University of Washington)
- Andrew Chen (2020, CMU, now a PhD student at Cornell)
- Parth Mittal (2020, Charles University Prague, now a PhD student at Rutgers)
- Pankaj Kumar (2020, Charles University Prague, now a PhD student at Charles University)

◇ **Visiting Undergraduate Students**:

- Nirmit Joshi (2020, VJTI Mumbai, now a PhD student at Northwestern)
- Milind Prabhu (2020, IIT Guwhati, now a PhD student at University of Michigan)

◇ **PhD Students Worked Closely with outside of Rutgers**:

- Soheil Behnezhad (University of Maryland, now an Assistant Professor at Northeastern)
- Raghuvansh Saxena (Princeton, now a postdoc at Microsoft Research New England)
- Sixue (Cliff) Liu (Princeton, now a postdoc at CMU)
- Yu Chen (University of Pennsylvania, now a postdoc at EPFL)

Thesis and Other Committees

◇ **PhD Thesis Committee:**

- Harsha Srimath Tirumala (Summer 2023, Rutgers, advisor: Eric Allender)
- Guido Tagliavini (Summer 2023, Rutgers, advisor: Martin Farach-Colton)
- Aditi Dudeja (Spring 2023, Rutgers, advisor: Aaron Bernstein)
- Vishwas Bhargava (Spring 2022, Rutgers, advisor: Shubhangi Saraf)
- Vishvajeet N. (Spring 2021, Rutgers, advisor: Swastik Kopparty)
- Sixue (Cliff) Liu (Spring 2021, Princeton, advisor: Robert Tarjan)
- Yikai Zhang (Fall 2020, Rutgers, advisor: Bahman Kalantari)

◇ **Qualification Exam Committee at Rutgers:**

- Zhenting Wang (Summer 2023)
- Kaidong Hu (Spring 2023)
- Janani Sundaresan (Spring 2023)
- Shiyang Lu (Winter 2022)
- Vihan Shah (Winter 2022)
- Hanna Komlos (Summer 2022)
- Zachary Langley (Summer 2022)
- Chun Lau (Summer 2022)
- Harsha Tirumala (Spring 2021)
- Guido Tagliavini (Winter 2020)
- Rui Wang (Winter 2020)
- Aditi Dudeja (Fall 2020)

Service and Professional Activities

Service and Professional Activities

◇ **Program Committees**:

- European Symposia on Algorithms (ESA 2023 – Track S)
- IEEE Symposium on Foundations of Computer Science (FOCS 2023)
- International Colloquium on Automata, Languages, and Programming (ICALP 2023)
- ACM SIAM Symposium on Discrete Algorithms (SODA 2023)
- International Conference on Database Theory (ICDT 2023)
- International Conference on Randomization and Computation (RANDOM 2022)
- European Symposia on Algorithms (ESA 2022)
- ACM Symposium on Theory of Computing (STOC 2022)
- ACM SIAM Symposium on Discrete Algorithms (SODA 2022)
- SIAM Symposium on Simplicity in Algorithms (SOSA 2022)
- ACM Symposium on Principles of Distributed Computing (PODC 2021)
- ACM Symposium on Principles of Database Systems (PODS 2021)
- International Colloquium on Automata, Languages, and Programming (ICALP 2020)
- ACM SIAM Symposium on Discrete Algorithms (SODA 2020)

◇ **Junior Program Committees**:

- ACM Conference on Economics and Computation (EC 2021, EC 2022)
- Conference on Learning Theory (COLT 2023, COLT 2021, COLT 2020)

◇ **Guest Editorships**:

- Co-editor for SIAM Journal on Computing (SICOMP) special issue for STOC, 2022
- Co-editor for ACM Transactions on Algorithms (TALG) special issue for SODA, 2020

◇ **External Reviewer**:

- Journals:
  - Journal of the ACM (JACM)
  - SIAM Journal on Computing (SICOMP)
  - Random Structures and Algorithms (RSA)
  - ACM Transactions on Computation Theory (TOCT)
  - ACM Transactions on Algorithms (TALG)
  - Journal of Machine Learning Research (JMLR)
  - IEEE Transactions on Parallel and Distributed Systems (TPDS)
  - Discrete Mathematics (DM)
  - Theoretical Computer Science (TCS)
- Conferences:
  - Symposium on Theory of Computing (STOC): 2015, 2018, 2019, 2020, 2021, 2022, 2023
  - Symposium on Foundations of Computer Science (FOCS): 2018, 2019, 2020, 2021, 2022
  - Symposium on Discrete Algorithms (SODA): 2017, 2018, 2019, 2021, 2023
  - Computational Complexity Conference (CCC): 2020, 2021
  - International Colloquium on Automata, Languages, and Programming (ICALP): 2016, 2017, 2018, 2019, 2021
  - European Symposium on Algorithms (ESA): 2016, 2019, 2020, 2021
  - Innovations in Theoretical Computer Science (ITCS): 2016, 2019, 2020, 2021, 2022, 2023
  - Symposium on Principles of Distributed Computing (PODC): 2019, 2022, 2023

  - International Symposium on Distributed Computing (DISC): 2020, 2021
  - International Symposium on Theoretical Aspects of Computer Science (STACS): 2018, 2020, 2021
  - Approximation, Randomization, and Combinatorial Optimization (APPROX-RANDOM): 2017, 2018, 2019, 2021, 2023
  - Integer Programming and Combinatorial Optimization (IPCO): 2023

◇ National Science Foundation Panel Service for AF – Algorithmic Foundations (2020, 2021)

◇ External Reviewer for the Icelandic Research Fund (2021)

◇ Guest Reviewer for SIGACT News, 2017 (review of SPAA 2017)

◇ Contributed article for SIGecom Exchanges, 2020

◇ Organizer of Rutgers/DIMACS theory seminar: 2019 to 2023

◇ **Department Committees, Rutgers**:

- Faculty hiring committee: 2020, 2021
- Graduate committee: 2019 to 2023
- PhD student admissions committee: 2019, 2020
- M.Sc student admissions committee: 2021, 2022, 2023

OUTREACH

◇ Annual lectures on "Algorithmic Thinking" given to high-school students at PACT, a summer program in Algorithmic and Combinatorial Thinking for high-school students, run by Prof. Rajiv Gandhi at Princeton (2018 to 2022)

◇ Mentoring undergraduate research as part of DIMACS REU program (5 students) and undergraduate independent studies and summer interns (8 students)

◇ Recipient of "Open and Affordable Textbook Program" award from Rutgers for developing affordable course materials for Algorithm Design course