

# Sepehr Assadi

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- ACADEMIC POSITIONS
- ◇ **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.
- EDUCATION
- ◇ **PhD in Computer Science,** August 2013 to December 2018  
**University of Pennsylvania,** Department of Computer and Information Science
    - *Advisor:* Prof. 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
    - *GPA:* 4/4.
  - ◇ **B.Sc. in Software Engineering,** September 2008 to July 2013  
**Sharif University of Technology,** Department of Computer Engineering
    - *Thesis:* The Rectangle Escape Problem
    - *Thesis supervisor:* Prof. Hamid Zarrabi-Zadeh
    - *GPA:* 18.30/20, *Major GPA:* 19.43/20.
- RESEARCH INTERESTS
- My primary research interest is in theoretical foundations of big data analysis. This in particular includes sublinear algorithms and lower bounds in various models of computation for processing massive datasets such as streaming, distributed communication, massively parallel computation, and sublinear time algorithms. I am also interested in communication complexity, online algorithms, and algorithmic game theory.
- HONORS AND AWARDS
- ◇ **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<sup>th</sup>** in the Asia Regional ACM-ICPC Contest, Tehran, Iran, 2012.
  - ◇ **Gold Medal** in the 17th Nationwide Scientific Olympiad for University Students in Computer Science, Iran, 2012.
  - ◇ Awarded as an **Exceptionally Talented Student,** Iran, 2011.
  - ◇ **Ranked 10<sup>th</sup>** in National Entrance Exam for M.Sc in Computer Science, Iran, 2010.

- TEACHING     ◇ **Design and Analysis of Computer Algorithms** (undergraduate level)  
                   • CS344 – Rutgers University. (Fall 2019)
- RESEARCH     ◇ **Summer internship at Google, NYC** June-August 2017  
 INTERNSHIP   Mentors: MohammadHossein Bateni and Vahab Mirrokni
- SERVICE       ◇ **Conference Program Committees:**  
                   • 31st Annual Symposium on Discrete Algorithms (SODA 2020).  
                   ◇ **External Reviewer:**  
                   • Journals: ACM Transactions on Algorithms (TALG), Algorithmica (ALGO), Theoretical  
                     Computer Science (TCS).  
                   • Conferences: FOCS'19, RANDOM'19, ESA'19, ICALP'19, PODC'19, STOC'19, SODA'19,  
                     ITCS'19, FOCS'18, EC'18, ICALP'18, STOC'18, WWW'18, STACS'18, SODA'18, APPROX'17,  
                     ICALP'17, SODA'17, SIROCCO'16, ESA'16, COLT'16, ICALP'16, ITCS'16, STOC'15.
- CONFERENCE   ◇ *Improved Truthful Mechanisms for Combinatorial Auctions with Submodular Bidders*  
 PAPERS       S. Assadi, S. Singla  
                   60th Annual IEEE Symposium on Foundations of Computer Science, **FOCS 2019**  
                   Invited to **SICOMP special issue** for FOCS 2019 papers
- ◇ *Secretary Ranking with Minimal Inversions*  
                   S. Assadi, E. Balkanski, R. Paes Leme  
                   33rd Conference on Neural Information Processing Systems, **NeurIPS 2019**
- ◇ *Massively Parallel Algorithms for Finding Well-Connected Components*  
                   S. Assadi, X. Sun, O. Weinstein  
                   ACM Symposium on Principles of Distributed Computing, **PODC 2019**
- ◇ *Distributed Weighted Matching via Randomized Composable Coresets*  
                   S. Assadi, M. Bateni, V. Mirrokni  
                   36th International Conference on Machine Learning, **ICML 2019**
- ◇ *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**
- ◇ *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**
- ◇ *Polynomial Pass Lower Bounds for Graph Streaming Algorithms*  
                   S. Assadi, Y. Chen, S. Khanna.  
                   51st ACM Symposium on Theory of Computing, **STOC 2019**
- ◇ *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**

- ◇ *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**
- ◇ *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**
- ◇ *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**
- ◇ *Stochastic Submodular Cover with Limited Adaptivity*  
A. Agarwal, S. Assadi, S. Khanna.  
30th Annual ACM-SIAM Symposium on Discrete Algorithms, **SODA 2019**
- ◇ *Towards a Unified Theory of Sparsification for Matching Problems*  
S. Assadi, A. Bernstein.  
2nd Symposium on Simplicity in Algorithms, **SOSA 2019**
- ◇ *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**
- ◇ *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**
- ◇ *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**
- ◇ *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**
- ◇ *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
- ◇ *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**
- ◇ *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**

- ◇ *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**
- ◇ *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
- ◇ *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
- ◇ *Algorithms for Provisioning Queries and Analytics*  
S. Assadi, S. Khanna, Y. Li, V. Tannen  
19th International Conference on Database Theory, **ICDT 2016**
- ◇ *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**
- ◇ *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**
- ◇ *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**  
Full version in **TEAC special issue** for WINE 2015 papers
- ◇ *Online Assignment of Heterogeneous Tasks in Crowdsourcing Markets*  
S. Assadi, J. Hsu, S. Jabbari  
3rd AAAI Conference on Human Computation & Crowdsourcing, **HCOMP 2015**
- ◇ *On The Rectangle Escape Problem*  
S. Assadi, E. Emamjomeh-Zadeh, S. Yazdanbod, H. Zarrabi-Zadeh  
25th Canadian Conference on Computational Geometry, **CCCG 2013**
- ◇ *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**  
Full version in **Algorithmica special issue** for ISAAC 2012 papers
- ◇ *Tight Bounds for Single-Pass Streaming Complexity of the Set Cover Problem*  
S. Assadi, S. Khanna, Y. Li  
SIAM journal on Computing (SICOMP), 2019
- ◇ *Fast Convergence in the Double Oral Auction*  
S. Assadi, S. Khanna, Y. Li, R. Vohra

JOURNAL  
PAPERS

ACM Transactions on Economics and Computation (TEAC), 2018

◇ *On the Rectangle Escape Problem*

A. Ahmadinejad, S. Assadi, E. Emamjomeh-Zadeh, S. Yazdanbod, H. Zarrabi-Zadeh  
Theoretical Computer Science, 2017

◇ *A Compile-Time Optimization Method for WCET Reduction in Real-Time Embedded Systems through Block Formation*

M. Mohajjel, M. Taram, S. Assadi, A. Ejlali  
ACM Transactions on Architecture and Code Optimization (TACO), 2016

◇ *The Minimum Vulnerability Problem*

S. Assadi, E. Emamjomeh-Zadeh, A. Norouzi-Fard, S. Yazdanbod, H. Zarrabi-Zadeh  
Algorithmica, 2014