Shahrzad Haddadan

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ACADEMIC APPOINTMENTS

- **Assistant Professor**   **Rutgers Business School**
  September 2022 – Present   *Department of Management Sciences and Information Systems (MSIS)*

- **Postdoctoral Researcher**   **Brown University**
  March 2020 – August 2022   *Department of Computer Science & Data Science Initiative (DSI)*

  Supervisor: Prof. Eli Upfal

- **Postdoctoral Researcher**   **La Sapienza (University of Rome I)**
  October 2016 – September 2019   *Dipartimento di Informatica*

  Supervisor: Prof. Flavio Chierichetti

EDUCATION

- **Doctor of Philosophy in Computer Science**   2010 – 2016
  Dartmouth College, *Hanover, NH*

  Dissertation title: *"algorithmic problems arising in posets and permutations"*, **Thesis Advisor: Prof. Peter Winkler.**

- **Master of Science in Computer Science**   2007 – 2010
  Sharif University of Technology, *Tehran, Iran*

- **Bachelor of Science in Computer Science**   2003 – 2007
  Sharif University of Technology, *Tehran, Iran*

RESEARCH INTERESTS

Broadly speaking I am interested in *mathematical modeling* and *algorithm design* in the context of big data and social networks. I pursue my research agenda in the following directions:

(i) The Markov chain Monte Carlo method: mixing problems and applications in design of statistical algorithms in non-i.i.d. sampling regimes.

(ii) Mathematical modeling of big data problems using combinatorial structures which lead to the development of rigorous algorithms for such problems.

PUBLICATIONS ▷ LINK TO GOOGLE SCHOLAR

Peer Reviewed Conferences:

1. **The Drift of #MyBodyMyChoice Discourse on Twitter,** Cristina Menghini, Justin Uhr, Shahrzad Haddadan, Ashley Champagne, Björn Sandstede, Sohini Ramachandran, **WebSci 2022**. *(Runner up for best paper award).*

2. **Fast Doubly-Adaptive MCMC to Estimate the Gibbs Partition Function with Weak Mixing Time Bounds**, Shahrzad Haddadan, Yue Zhuang, Cyrus Cousins, Eli Upfal. In the 35th Conference on Neural Information Processing Systems, **NeurIPS 2021**.

3. **RePBubLik: Reducing polarized bubble radius with link insertions**, Shahrzad Haddadan, Cristina Menghini, Matteo Riondato, Eli Upfal. In the 14th ACM International on Web Search and Data mining, **WSDM 2021**. *(Best paper honorable mention).*

4. **A theoretical analysis of graph evolution caused by triadic closure and algorithmic implications**, Sara Ahmadian, Shahrzad Haddadan. In the IEEE International Conference on Big Data, **IEEE Big data 2020.** *(Accepted for long presentation).*

5. **Mallows models for top-k lists**, Flavio Chierichetti, Anirban Dasgupta, Shahrzad Haddadan, Ravi Kumar, Silvio Lattanzi, In Proceedings of the 32nd Conference on Neural Information Processing Systems, **NeurIPS 2018**.

6. **On the complexity of sampling nodes uniformly from a graph**, Flavio Chierichetti, Shahrzad Haddadan. In Proceedings of the 45th International Colloquium on Automata, Languages, and Programming, **ICALP 2018**.

7. **Mixing of permutations by biased transposition**, Shahrzad Haddadan, Peter Winkler. At 34th Symposium on Theoretical Aspects of Computer Science, **STACS 2017**. *(Invited to special issue of Theory of Computing Systems).*

8. **Evaluation of background subtraction methods**, Soraya Panahi, Samira Sheikhi, Shahrzad Haddadan, Niloofar Gheissari. In the IEEE proceeding, Digital Image Computing Technique and Application, **DICTA 2008**.

Journals:

9. **The Wedge Picking model: A theoretical analysis of graph evolution caused by triadic closure and algorithmic implications**, Sara Ahmadian, Shahrzad Haddadan. The Journal of Strategic Innovation and Sustainability Vol. 16(3) 2021.

10. **Some instances of homomesy among ideals of posets**, Shahrzad Haddadan. The Electronic Journal of Combinatorics. Vol. 28(1), 2021. *(Discussed in a book chapter of "Recent trends in Combinatorics").*

11. **Mixing time bounds for graphlet random walks**, Matteo Agostini, Marco Bressan, Shahrzad Haddadan. Information Processing Letters (IPL), Vol. 152, 105851, 2019.

12. **Mixing time for some adjacent transposition Markov chains**, Shahrzad Haddadan, Peter Winkler. Theory of Compututing Systems (TOCS) 63(5), 2019.

13. **The expected jaggedness of order ideals**, Melody Chan, Shahrzad Haddadan, Sam Hopkins, Luca Moci. At Forum of Mathematics, Sigma, Vol 5, 2017. *(Discussed in a book chapter of "Recent trends in Combinatorics").*

Research Visits

- **Guest Researcher**   October 2019 – February 2020
  Max-Planck-Institut für Informatik, Dept. 1: Algorithms and Complexity

- **Scholar in Residence**   August 2019
  Indian Institute Of Technology Gandhinagar

Teaching Experience

Discrete Mathematics in Computer Science, *Brown University, Winter 2021, 187 students.*

Probability for Computing and Data Analysis, *Brown University, Fall 2020, 25 students* (Co-instructor with Eli Upfal).

Discrete Mathematics in Computer Science, *Dartmouth College, Winter 2014, 33 students.*

Invited Talks

- **Reducing polarization in graphs by inserting edges and swapping edge weights**   November 2021
  Google New York (algorithms seminar)
- **RePBubLik: Reducing polarized bubble radius with link insertions**   April 2021
  University of California, Santa Cruz (theory reading group)
- **Algorithms for top-k lists and Social Network**   December 2019
  Institut de Recherche en Informatique Fondamentale (IRIF)
- **Random Walks & Application in Exploring Networks and Ranking Objects**   September 2019
  Max-Planck-Institut für Informatik, Saarbrücken, Germany
- **Random Walks & Application in Exploring Networks and Ranking Objects**   August 2019
  Indian Institute Of Technology Gandhinagar
- **The Markov chain Monte Carlo method (A short course)**   March 2017
  Sharif University of Technology, Tehran, Iran
- **Permutations and Spin Systems**   January 2015
  Joint Mathematics Meetings, San Antonio, TX, USA

Honors and Awards

- Research awards:

    - *Best paper honorable mention*, the 14th ACM International on Web Search and Data mining, WSDM 2021.

    - *Best talk award*, annual research symposium of Computer Science Department, Dartmouth College, 2015.

    - *Runner up* for best talk award, annual research symposium of Computer Science Department, Dartmouth College, 2012.

    - *Runner up* for best poster award, annual research symposium of Computer Science Department, Dartmouth College, 2011.

- Fellowships and Travel awards:

    - *SIAM early career travel award*, for SDM 2021.

    - *FSMP postdoctoral laureate;* awarded by the Foundation Sciences Mathématiques de Paris, 2020.

- Ranked second among B.Sc Computer Science students of Sharif University, and M.Sc entrance exam waived, 2003 – 2007.

Academic Services

Organizing services

- **Session chair at the SIAM International Conference on Data Mining**   April 29 – May 1, 2021
  Session: Foundations of Data Science @ SDM 2021
- **Fair February symposium (Computation and social justice)**   February 2022
  Brown university (DSI)
- **Fair February symposium (Computation and social good)**   February 2021
  Brown university (DSI)
- **CSRS, the annual research symposium of computer science**   September 2014
  Dartmouth College (CS dept.)

Reviewing services

Program Committee of the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases: ECMLPKDD 2022.

Program Committee of the research paper track on Social Network Analysis and Graph Algorithms at The Web Conference a.k.a. WWW 2022.   *(Best reviewer honorable mention).*

Program Committee of the research paper track on Social Network Analysis and Graph Algorithms at The Web Conference a.k.a. WWW 2021.

Program Committee of the SIAM International Conference on Data Mining: SDM 2021.

Reviewer/sub-reviewer

- The ACM-SIAM Symposium on Discrete Algorithms SODA: 2022, 2021, 2018
- The Web Conference a.k.a WWW: 2020
- The ACM SIGKDD Conference on Knowledge Discovery & Data Mining KDD: 2020
- The European symposium on algorithms ESA: 2019, 2018
- The International Conference on Complex Networks and their Applications: 2018