

Jain, Shweta – CV

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Research Interests

Randomized and approximation algorithms, combinatorial optimization, graph mining, algorithms for massive data

Current Appointment

2021- Postdoc, University of Utah, Salt Lake City (Advisor: Prof. Blair Sullivan)

Past Appointment

2020-2021 Postdoc, University of Illinois, Urbana-Champaign (Advisor: Prof. Hanghang Tong)

Education

2014–2020 Ph.D., Computer Science, University of California, Santa Cruz
Thesis Title: Counting cliques in real-world graphs (Advisor: Prof. Seshadhri Comandur)

2012–2013 M.S., Computer Science, University of Chicago

2005–2009 B.E., Computer Engineering, Pune Institute of Computer Technology (PICT)
Thesis Title: Space Maps in Ext4

Selected Honors and Awards

- 2021 Awarded the [CIFellowship](#) by the CRA and CCC (branches of the NSF) for a 2-year postdoc (75000 per year). About 50 students were awarded from all over the country from among >500 applicants. Preference was given to Citizens and Permanent Residents (I am neither).
- 2021 Awarded the [SIGKDD Best Dissertation Award - Runner-Up](#). Awarded to the 2nd most innovative and impactful dissertation in Data Science, internationally.
- 2020 CSE Best Dissertation Award, UCSC, 2020
- 2020 Best Paper Award at WSDM, 2020. Awarded to the Best Research Paper from among 615 submitted papers.
- 2020 Selected for Rising Stars Workshop, Berkeley, 2020
- 2019 Best Poster Award, Foundations of Data Science Workshop, GeorgiaTech, Atlanta
- 2018 BSOE Dissertation Year Fellowship, 2018-19
- 2017 Best Paper Award at WWW, 2017. Awarded to the Best Research Paper from among >1000 submitted papers.
- 2014 UC Santa Cruz Regents' Fellowship, 2014
- 2010 Best Alumni Research (PICT), 2010

Publications

- [1] **Jain, S.**, Tong, H., YACC: A Framework Generalizing TuránShadow for Counting Large Cliques. In SIAM International Conference on Data Mining (SDM), 2022.
- [2] **Jain, S.**, Behera, B., Seshadhri, C., Improved FPT bounds for finding maximal dense subgraphs in c -closed graphs. In Innovations in Theoretical Computer Science (ITCS), 2022.
- [3] **Jain, S.**, Seshadhri, C., The power of pivoting for exact clique counting. In Proceedings of the 13th ACM International Conference on Web Search and Data Mining (WSDM), 2020. **Winner of Best Paper Award.**
- [4] **Jain, S.**, Seshadhri, C., Provably and Efficiently Approximating Near-cliques using Turán Shadow: PEANUTS. In The Web Conference (formerly WWW), 2020.
- [5] Nassar, H., Gleich, D., Benson, A., **Jain, S.** and Kennedy, C., Using cliques with higher-order spectral embeddings improves graph visualizations. In The Web Conference (formerly WWW), 2020.
- [6] Eden, T., **Jain, S.**, Pinar, A., Ron D., Seshadhri, C., Provable and practical approximations for the degree distribution using sublinear graph samples. In The Web Conference (formerly WWW), 2018.

- [7] **Jain, S.**, Seshadhri, C., A Fast and Provable Method for Estimating Clique Counts Using Turán’s Theorem. In 26th International Conference on World Wide Web (WWW), 2017. **Winner of Best Paper Award.**
- [8] Kadekodi, S., **Jain, S.**, Taking Linux Filesystems to the Space Age: Space Maps in Ext4. In Ottawa Linux Symposium, 2010.

Program Committees

SDM 2020, CIKM 2021

Work Experience

- 2016 **Summer Intern, Sandia National Labs**, Livermore, CA (Mentor: Ali Pinar)
Developed an algorithm for estimating the degree distribution of a graph by simulating edge sampling using vertex sampling. Paper published at The Web Conference, 2018.
- 2013 **Visiting Pre-doctoral Fellow, Northwestern University** (Mentor: Prof. Jason Hartline)
Studied the structural properties of revenue-optimal mechanisms for a multi-dimensional unit-demand agent, including variants with supply and allocation constraints.
- 2011–2012 **Associate Engr., Oneirix Engineering Labs Pvt. Ltd.**, Pune, India (Mentor: Udayan Kanade)
As part of the Computer Science Research Group, work included simulating optical phenomena including scattering and fluorescence using the Monte Carlo method, writing a nonlinear static equilibrium solver and performing spline based shape optimization of mechanical parts, and creating tools to manipulate huge image datasets in real time.

Teaching Assistance

- 2015 CMPS101, Algorithms and Abstract Data Types, University of California, Santa Cruz
2017 CMPS12B/M, Introduction to Data Structures, University of California, Santa Cruz

Students Mentored

Balaram Behera, senior year, UCSC

Invited Talks

- 2021 Counting Cliques in Real-World Graphs - Talk at IDEA Lab, University of Illinois, Urbana-Champaign, IL, USA
- 2020 Counting Cliques in Real-World Graphs - Talk at CS4Math, Harvard, Cambridge, MA, USA
- 2020 Counting Cliques in Real-World Graphs - Talk at Theory Lunch, MIT, Cambridge, MA, USA
- 2020 Counting Cliques in Real-World Graphs - Talk at Theory Lunch, Carnegie Mellon University, Pittsburgh, PA, USA
- 2020 Counting Cliques in Real-World Graphs - Talk at Theory Lunch, GeorgiaTech, Atlanta, GA, USA
- 2020 Counting Near-Cliques using the TuránShadow - Paper presentation at WWW, 2020
- 2020 The Power of Pivoting for Exact Clique Counting - Paper presentation at WSDM, 2020 at Houston, TX, USA
- 2019 An $O(3^{\frac{n}{3}})$ algorithm for clique counting - Talk at Theory of Computing Associated - Silicon Valley (TOCA-SV)
- 2019 Estimating degree distribution - Talk at Stanford Theory Lunch
- 2018 Turán Shadow and its Extensions - Talk at Purdue University
- 2018 Applications of Sampling in Graphs - Talk at LIP6, Sorbonne University, Paris, France
- 2018 Estimating Degree Distribution - Paper presentation at The Web Conference (formerly WWW), 2018 at Lyon, France
- 2018 Estimating Degree Distribution - Student talk at Theory of Computing Associated - Silicon Valley (TOCA-SV) at Google
- 2017 Clique Counting - Student talk at TOCA-SV @ Google
- 2017 Clique Counting - Paper presentation at the 26th International Conference on World Wide Web (WWW)
- 2017 Clique Counting - Poster presentation at Symposium on the Theory of Computing (STOC)
- 2016 Clique Counting - Student talk at Women in Theory (WIT)