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Sharat Ibrahimpur

For references, please contact:

- Prof. Chaitanya Swamy (University of Waterloo, cswamy@uwaterloo.ca)
- Prof. László Végh (University of Bonn, lvegh@uni-bonn.de)
- Prof. Neil Olver (London School of Economics, n.olver@lse.ac.uk)
- Prof. Joseph Cheriyan (University of Waterloo, jcheriyan@uwaterloo.ca)
- Prof. Vera Traub (ETH Zürich, vtraub@ethz.ch)

Academic Employment

Oct 2025 – Sept 2026 **Postdoctoral Researcher**, ETH Zürich, Switzerland
Host: Prof. Vera Traub
Part of the Department of Computer Science working on designing approximation algorithms for network design and max-min fairness problems.

Sept 2024 – Sept 2025 **Postdoctoral Researcher**, University of Bonn, Germany
Hosts: Profs. Vera Traub and Jens Vygen
Part of the Research Institute for Discrete Mathematics working on designing approximation algorithms for problems in stochastic load balancing and network design, and implementing practical heuristics for a 2-stage vehicle-routing problem called district design.

Sept 2022 – Sept 2024 **Postdoctoral Researcher**, London School of Economics, UK
Hosts: Profs. Neil Olver and László Végh
Part of the Operations Research Group in the Department of Mathematics working on designing approximation algorithms for stochastic scheduling and network design problems.

Education

Sept 2016 – July 2022 **PhD in Combinatorics and Optimization**, University of Waterloo, Canada
Thesis Title: Stochastic Minimum Norm Combinatorial Optimization
Advisor: Prof. Chaitanya Swamy
External Committee Member: Prof. Sanjeev Khanna (Univ. of Pennsylvania)
Internal Members: Profs. Eric Blais, Joseph Cheriyan, and Jochen Koenemann.

Sept 2015 – Sept 2016 **M.Math. in Combinatorics and Optimization**, University of Waterloo
Thesis Title: Packing and Covering Odd (u, v)-trails in a Graph
Advisor: Prof. Chaitanya Swamy

Aug 2008 – May 2013 **Integrated B.Sc and M.Sc. in Applied Mathematics**, Department of Mathematics, Indian Institute of Technology Roorkee, India

Research Internship

May 2021 – Oct 2021 **Research Intern**, Discrete Algorithms Group, Google Research (Virtual)
Introduced and studied the caching with reserves problem. Implemented a greedy heuristic for improving memory space assignment on accelerators.

Industry Employment

June 2013 – July 2015 **Senior Analyst**, Goldman Sachs, Bangalore, India
Worked on risk models used by Global Securities Services, Prime Brokerage, and Clearing businesses undertaken by Goldman Sachs.

Distinctions and Scholarships

2023 **Second place in Mathematics Doctoral Prize competition**
Nominated by the Department of Combinatorics and Optimization for this doctoral award by the Faculty of Mathematics, University of Waterloo.

2022 **One of 4 finalists for Alumni Gold Medal at doctoral level**
Nominated by the Faculty of Mathematics for this doctoral award by the University of Waterloo.

Winter 2022 **Doctoral Thesis Completion Award**, University of Waterloo

Fall 2018 **William Tutte Postgraduate Scholarship**, University of Waterloo

Winter 2017 **Susan and Janos Aczel Graduate Scholarship**, University of Waterloo

2009 – 2013 **Kishore Vaigyanik Protsahan Yojana (KVPY) Fellowship**, India

2011 – 2013 **National Board for Higher Mathematics Fellowship**, India

Invited and Contributed Talks

March 5, 2025 **Stochastic Minimum Norm Combinatorial Optimization**, 10th Colloquium of Research Area C3, University of Bonn, Germany

January 23, 2025 **An O(log n)-Approximation Algorithm for (p, q)-Flexible Graph Connectivity via Independent Rounding**, Santiago Summer Workshop on Combinatorial Optimization 2025, Pontificia Universidad Católica de Chile, Santiago, Chile

July 22, 2024 **Approximation Algorithms for Stochastic Minimum Norm Combinatorial Optimization**, International Symposium on Mathematical Programming (ISMP) 2024, Montreal, Canada

Nov 28, 2023 **Efficient Caching with Reserves via Marking**, Department of Computer Science, University of Liverpool, UK

May 26, 2021 **Approximation Algorithms for Stochastic Minimum Norm Combinatorial Optimization**, CanaDAM 2021, Canada (Virtual)

July 5, 2018 **Min-Max Theorems for Packing and Covering Odd (u,v)-trails**, ISMP 2018, Bordeaux, France

Workshops

Jan 2025 **Santiago Summer Workshop on Combinatorial Optimization**, Pontificia Universidad Católica de Chile, Santiago, Chile

Sept 2024 **13th Cargese Workshop on Combinatorial Optimization**, Institut d'Etudes Scientifiques de Cargèse, Corsica, France

July 2024 **Fulkerson 100 Workshop**, University of Waterloo, Canada

July 2023 **International Colloquium on Automata, Languages, and Programming (ICALP) 2023 Workshop**, *Recent Trends in Online Algorithms*, Paderborn University, Germany

Sept 2018 **The Traveling Salesman Problem: Algorithms and Optimization**, Banff International Research Station, Canada

June 2017 **Symposium on the Theory of Computing (STOC) 2017 Theory Fest**, McGill University and Université de Montréal, Canada

Summer Schools

June 2025 **IPCO 2025 Summer School**, Johns Hopkins University, USA

June 2020 **IPCO 2020 Summer School**, London School of Economics, UK

May 2019 **IPCO 2019 Summer School**, University of Michigan, USA

Aug 2018 **Hausdorff School on Combinatorial Optimization**, Research Institute for Discrete Mathematics, Bonn, Germany

June 2017 **IPCO 2017 Summer School**, University of Waterloo, Canada

Organizational Experience

August 2024 **Part of the local organizing team for APPROX 2024 conference**, London School of Economics and Political Science, UK

2018 – 2020 **Co-organizer of the Combinatorial Optimization Reading Group**, University of Waterloo, Canada

Service/Reviewing Activities

Program Committee: Served on the program committee for the Engineering and Applications track of the European Symposium on Algorithms (ESA) 2024.

Journal Reviewer: Mathematical Programming, Discrete Optimization, Mathematics of Operations Research

Conference Reviewer: STOC, FOCS, SODA, ICALP, ESA, IPCO, APPROX, STACS, ISAAC, and WADS

Competitive Programming Experience

July 2013 **Ranked 61 out of 120 teams at the ACM-ICPC World Finals**
Represented Indian Institute of Technology Roorkee at an international programming competition held in St. Petersburg, Russia.

Dec 2012 **Ranked 3 in the ACM-ICPC Amritapuri Regional Contest**, India
Represented Indian Institute of Technology Roorkee at the qualifier competition for the 2013 ACM-ICPC World Finals.

Nov 2017 – May 2018 **Parameterized Algorithms and Computational Experiments Challenge**
Implemented exact (Track A) and approximation algorithms (Track C) for the Steiner Tree problem in C++ at PACE 2018.
Code: `https://github.com/sharat1105/PACE2018`

Publications

List of publications, in reverse chronological order, in journals or peer-reviewed conference proceedings. Authors are ordered alphabetically. Please refer to `https://i-sharat.github.io` for a continuously updated list of publications along with links to full versions and pre-recorded talks.

1. Sharat Ibrahimpur and László A. Végh. *An O(log n)-Approximation Algorithm for (p,q)-Flexible Graph Connectivity via Independent Rounding*. In Proceedings of Integer Programming and Combinatorial Optimization (IPCO), 2025. `https://doi.org/10.1007/978-3-031-93112-3_23`

2. Ishan Bansal, Joseph Cheriyan, Logan Grout, and Sharat Ibrahimpur. *Improved Approximation Algorithms by Generalizing the Primal-Dual Method Beyond Uncrossable Functions*. In Algorithmica, 2024. `https://doi.org/10.1007/s00453-024-01235-2`

3. Ishan Bansal, Joseph Cheriyan, Logan Grout, and Sharat Ibrahimpur. *Algorithms for 2-Connected Network Design and Flexible Steiner Trees with a Constant Number of Terminals*. In Proceedings of Conference on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), 2023. `https://doi.org/10.4230/LIPIcs.APPROX/RANDOM.2023.14`

4. Sharat Ibrahimpur, Manish Purohit, Zoya Svitkina, Erik Vee, and Joshua R. Wang. *Efficient Caching with Reserves via Marking*. In Proceedings of International Colloquium on Automata, Languages, and Programming (ICALP), 2023. `https://doi.org/10.4230/LIPIcs.ICALP.2023.80`

5. Ishan Bansal, Joseph Cheriyan, Logan Grout, and Sharat Ibrahimpur. *Improved Approximation Algorithms by Generalizing the Primal-Dual Method Beyond Uncrossable Functions*. In Proceedings of International Colloquium on Automata, Languages, and Programming (ICALP), 2023. `https://doi.org/10.4230/LIPIcs.ICALP.2023.15`

6. Sylvia Boyd, Joseph Cheriyan, Arash Haddadan, and Sharat Ibrahimpur. *Approximation Algorithms for Flexible Graph Connectivity*. In Mathematical Programming, 2023. `https://doi.org/10.1007/s10107-023-01961-5`

7. Sylvia Boyd, Joseph Cheriyan, Robert Cummings, Logan Grout, Sharat Ibrahimpur, Zoltán Szigeti, and Lu Wang. *A 4/3-Approximation Algorithm for the Minimum 2-Edge Connected Multisubgraph Problem in the Half-Integral Case*. In SIAM Journal on Discrete Mathematics (SIDMA), 2022. https://doi.org/10.1137/20M1372822

8. Sharat Ibrahimpur, Manish Purohit, Zoya Svitkina, Erik Vee, and Joshua R. Wang. *Caching with Reserves*. In Proceedings of Conference on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), 2022. https://doi.org/10.4230/LIPIcs.APPROX/RANDOM.2022.52

9. Sharat Ibrahimpur and Chaitanya Swamy. *A Simple Approximation Algorithm for Vector Scheduling and Applications to Stochastic Min-Norm Load Balancing*. In Proceedings of Symposium on Simplicity in Algorithms (SOSA), 2022. https://doi.org/10.1137/1.9781611977066.18

10. Sylvia Boyd, Joseph Cheriyan, Arash Haddadan, and Sharat Ibrahimpur. *Approximation Algorithms for Flexible Graph Connectivity*. In Proceedings of Foundations of Software Technology and Theoretical Computer Science (FSTTCS), 2021. https://doi.org/10.4230/LIPIcs.FSTTCS.2021.9

11. Sharat Ibrahimpur and Chaitanya Swamy. *Minimum-Norm Load Balancing Is (Almost) as Easy as Minimizing Makespan*. In Proceedings of International Colloquium on Automata, Languages, and Programming (ICALP), 2021. https://doi.org/10.4230/LIPIcs.ICALP.2021.81

12. Sharat Ibrahimpur and Chaitanya Swamy. *Approximation Algorithms for Stochastic Minimum-Norm Combinatorial Optimization*. In Proceedings of Symposium on Foundations of Computer Science (FOCS), 2020. https://doi.org/10.1109/FOCS46700.2020.00094

13. Sylvia Boyd, Joseph Cheriyan, Robert Cummings, Logan Grout, Sharat Ibrahimpur, Zoltán Szigeti, and Lu Wang. *A 4/3-Approximation Algorithm for the Minimum 2-Edge Connected Multisubgraph Problem in the Half-Integral Case*. In Proceedings of Conference on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), 2020. https://doi.org/10.4230/LIPIcs.APPROX/RANDOM.2020.61

14. Sharat Ibrahimpur and Chaitanya Swamy. *Min-Max Theorems for Packing and Covering Odd (u, v)-trails*. In Proceedings of Integer Programming and Combinatorial Optimization (IPCO), 2017. https://doi.org/10.1007/978-3-319-59250-3_23

Theses

15. S. Ibrahimpur (2022). *Stochastic Minimum Norm Combinatorial Optimization*. PhD Thesis, University of Waterloo. http://hdl.handle.net/10012/18471.

16. S. Ibrahimpur (2016). *Packing and Covering Odd (u, v)-trails in a Graph*. M.Math. Thesis, University of Waterloo. http://hdl.handle.net/10012/10939.