Sharat Ibrahimpur

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For references, please contact:

- Prof. Chaitanya Swamy (University of Waterloo, `cswamy@uwaterloo.ca`)
- Prof. László Végh (London School of Economics, `l.vegh@lse.ac.uk`)
- Prof. Neil Olver (London School of Economics, `n.olver@lse.ac.uk`)
- Prof. Joseph Cheriyan (University of Waterloo, `jcheriyan@uwaterloo.ca`)

Academic Employment

Sept '24 – Sept '26 (Ongoing) **Postdoctoral Researcher**, *University of Bonn*, Germany
Host: Prof. Vera Traub
Part of the Research Institute for Discrete Mathematics working on designing approximation algorithms for network design problems.

Sept '22 – Sept '24 **Postdoctoral Researcher**, *London School of Economics*, UK
Hosts: Profs. László Végh and Neil Olver
Part of the Operations Research Group in the Department of Mathematics working on designing approximation algorithms for stochastic scheduling, asymmetric Nash social welfare, and online bipartite matching problems.

Education

Sep 2016 – July 2022 **PhD in Combinatorics and Optimization**, University of Waterloo, Canada
Thesis: *Stochastic Minimum Norm Combinatorial Optimization*
Advisor: Prof. Chaitanya Swamy
Ext. Committee Member: Prof. Sanjeev Khanna (Univ. of Pennsylvania)
Int. Members: Profs. Eric Blais, Joseph Cheriyan, and Jochen Koenemann.
Department: Combinatorics and Optimization, GPA: 94.88/100

Sep 2015 – Sep 2016 **M.Math. in Combinatorics and Optimization**, University of Waterloo, Canada
Thesis: *Packing and Covering Odd* (u, v)*-trails in a Graph*
Advisor: Prof. Chaitanya Swamy
Department: Combinatorics and Optimization, GPA: 90.75/100

Aug 2008 – May 2013 **Integrated B.Sc and M.Sc. in Applied Mathematics**, Indian Institute of Technology Roorkee, India
Department: Mathematics, GPA: 7.8/10

Research Internship

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

Industry Employment

Jun 2013 – Jul 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**
Scholarship funded by the Government of India to support undergraduate studies in basic sciences.

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

2012 **Rank 7 in Graduate Aptitude Test in Engineering**, *India*
Subject: Mathematics

2012 **Rank 5 in National Eligibility Test (NET)**, *India*
Subject: Mathematics

2007 **Qualified for Regional Mathematical Olympiad**, *Karnataka*, India

Invited and Contributed Talks

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

Workshops

Sept 2 – 6, 2024 **13th Cargese Workshop on Combinatorial Optimization**, Institut d'Etudes Scientifiques de Cargèse, Corsica, France

July 17 – 19, 2024 **Fulkerson 100 Workshop**, University of Waterloo, Canada

July 10, 2023 **International Colloquium on Automata, Languages, and Programming (ICALP) 2023 Workshop**, *Recent Trends in Online Algorithms*, Paderborn University, Germany

Sept 23 – 28, 2018 **The Traveling Salesman Problem: Algorithms and Optimization**, Banff International Research Station, Canada

June 23, 2017 **Symposium on the Theory of Computing (STOC) 2017 Theory Fest**, McGill University and Université de Montréal, Canada

Summer Schools

June 6 – 7, 2020 **Conference on Integer Programming and Combinatorial Optimization (IPCO) 2020 Summer School**, London School of Economics, UK (Virtual)

May 20 – 21, 2019 **IPCO 2019 Summer School**, University of Michigan, Ann Arbor, USA

Aug 20 – 24, 2018 **Hausdorff School on Combinatorial Optimization**, Research Institute for Discrete Mathematics, Bonn, Germany

June 24 – 25, 2017 **IPCO 2017 Summer School**, University of Waterloo, Canada

Organizational Experience

August 28 – 30, 2024 **Part of the local organizing team for APPROX 2024 conference**, *London School of Economics*

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

Reviewing Activities

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

Journal Reviewer Discrete Optimization, Mathematics of Operations Research

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

Competitive Programming Experience

Jul 2013 **Ranked 61 out of 120 teams at the ACM-ICPC World Finals**, St. Petersburg, Russia
Represented Indian Institute of Technology Roorkee.

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

Nov 2017 – May 2018 **Parameterized Algorithms and Computational Experiments Challenge (PACE) 2018**
Implemented exact (Track A) and approximation algorithms (Track C) for the Steiner Tree problem in C++.
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. 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`

2. 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`

3. 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`

4. 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`

5. 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`

6. 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

7. 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

8. 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

9. 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

10. 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

11. 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

12. 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

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

14. 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.