

RESEARCH INTERESTS	<b>Fast Algorithms for Optimization</b> My work focuses on the design of fast algorithms for problems in optimization, machine learning and theoretical computer science, using tools from continuous optimization.	
APPOINTMENTS	<ul style="list-style-type: none"> <li>• <b>Institute for Theoretical Studies, ETH Zurich</b> Junior Fellow</li> <li>• <b>Simons Institute for Theory of Computation</b> Visiting Scientist</li> <li>• <b>University of Michigan</b> Research Associate, Department of Computer Science</li> </ul>	<p>Zurich, Switzerland Jan 2023 - Current</p> <p>Berkeley, CA, USA Aug 2023 - Dec 2023</p> <p>Ann Arbor, MI, USA Sep 2022 - Dec 2022</p>
EDUCATION	<ul style="list-style-type: none"> <li>• <b>University of Toronto</b> Ph.D., Department of Computer Science Advisor: Prof. Sushant Sachdeva MSc., Department of Computer Science</li> <li>• <b>Indian Institute of Science Education and Research Pune</b> BS-MS Dual Degree, Mathematics Department Thesis: <i>Matching Under Preferences</i> Advisor: Prof. Saket Saurabh (IMSc Chennai)</li> </ul>	<p>Toronto, ON, Canada Sep 2017 - Aug 2022</p> <p>Sep 2017 - Jan 2019</p> <p>Pune, India Aug 2012 - May 2017</p>
HONORS AND AWARDS	<ul style="list-style-type: none"> <li>• <i>Alfred B. Lehman Graduate Scholarship</i> (\$5000)</li> <li>• <i>Monica Ryckman Bursary</i> (\$5000) <i>Dept. of Computer Science, University of Toronto</i></li> <li>• <i>NSERC - Post Graduate Scholarship</i> (\$21,000 per year) <i>Natural Sciences and Engineering Research Council of Canada</i></li> <li>• <i>Ontario Graduate Scholarship</i> (\$15,000) <i>Ontario Govt. and University of Toronto</i></li> <li>• <i>DST-INSPIRE Fellowship</i> <i>Govt. of India</i></li> <li>• <i>S.N. Bhatt Memorial Excellence Fellowship</i> <i>International Centre for Theoretical Sciences, India</i></li> </ul>	<p>Jan 2022</p> <p>Jan 2021</p> <p>May 2020 - Apr 2023</p> <p>May 2018 - Apr 2019</p> <p>Aug 2012 - May 2017</p> <p>Jun 2015 - Jul 2015</p>
PUBLICATIONS	<ol style="list-style-type: none"> <li>1. <b>Deeksha Adil</b>, Jarosław Błasiok. <i>Efficient and Provable Algorithms for Covariate Shift</i>. 2025. Under Review.</li> <li>2. <b>Deeksha Adil</b>, Brian Bullins, Arun Jambulapati, Aaron Sidford. <i>Convex optimization with <math>p</math>-norm oracles</i>. 2024. Under Review.</li> <li>3. <b>Deeksha Adil</b>, Shunhua Jiang, Rasmus Kyng. <i>Acceleration Meets Inverse Maintenance: Faster <math>\ell_\infty</math>-Regression</i>. 2024. Under Review.</li> <li>4. <b>Deeksha Adil</b>, Thatchaphol Sararunak. <i>Decremental <math>(1 + \epsilon)</math>-Approximate Maximum Eigenvector: Dynamic Power Method</i>. 2024. Under Review.</li> <li>5. <b>Deeksha Adil</b>, Rasmus Kyng, Richard Peng, Sushant Sachdeva. <i>Fast Algorithms for <math>\ell_p</math>-Regression</i>. Accepted and to appear at Journal of the ACM, 2024.</li> <li>6. <b>Deeksha Adil</b>, Arun Jambulapati, Brian Bullins, Sushant Sachdeva. <i>Optimal Methods for Higher-Order Smooth Monotone Variational Inequalities</i>. Under Review.</li> <li>7. <b>Deeksha Adil</b>, Brian Bullins, Sushant Sachdeva. <i>Unifying Width-Reduced Methods for Quasi-Self-Concordant Optimization</i>. In Proceedings of the Thirty-fifth Conference on Neural Information Processing Systems (NeurIPS) 2021.</li> </ol>	

8. **Deeksha Adil**, Brian Bullins, Rasmus Kyng, Sushant Sachdeva. *Almost-Linear Time Weighted  $\ell_p$ -norm Solvers in Slightly Dense Graphs via Sparsification*. In Proceedings of the 48th International Colloquium on Automata, Languages, and Programming (ICALP) 2021.
9. **Deeksha Adil** and Sushant Sachdeva. *Faster  $p$ -norm minimizing flows, via smoothed  $q$ -norm problems*. In Proceedings of the Thirty First Annual ACM-SIAM Symposium on Discrete Algorithms (SODA) 2020.
10. **Deeksha Adil**, Richard Peng and Sushant Sachdeva. *Fast, Provably convergent IRLS Algorithm for  $p$ -norm Linear Regression*. In Proceedings of the Thirty-third Conference on Neural Information Processing Systems (NeurIPS) 2019.
11. **Deeksha Adil**, Rasmus Kyng, Richard Peng, and Sushant Sachdeva. *Iterative refinement for  $\ell_p$ -norm regression*. In Proceedings of the Thirtieth Annual ACM-SIAM Symposium on Discrete Algorithms (SODA) 2019.
12. **Deeksha Adil**, Sushmita Gupta, Sanjukta Roy, Saket Saurabh, Meirav Zehavi. *Parameterized Algorithms for the Stable Matching Problem with Ties and Incomplete Lists*. Theoretical Computer Science. 723. 10.1016/j.tcs.2018.03.015. 2018

## TALKS

- *Optimization and Fast Data Structures*  
 Indian Institute of Science Bangalore, Theory Seminar Aug 2024  
 Microsoft Research Aug 2024  
 Indian Institute of Technology, Madras Theory Seminar Aug 2024  
 The Institute of Mathematical Sciences, Chennai Aug 2024  
 Tata Institute for Fundamental Research, Mumbai Sep 2024
- *Tutorial on Fast Inverse Maintenance Data Structures*  
 ETH Zürich Winter School in Zinal, Switzerland Jan 2024
- *Dynamically Computing Approximate Eigenvectors*  
 Institut de Recherche en Informatique Fondamentale (IRIF), Paris Dec 2023  
 Theory Breakfast, ETH Zürich May 2024  
 Dagstuhl Workshop AlgPIE Sep 2024
- *Lectures on Higher Order Optimization*  
 Simons Institute for the Theory of Computation  
 Data Structures and Optimization for Fast Algorithms Bootcamp, Berkeley Sep 2023  
 Part 1, Part 2
- *Width-Reduced Methods for Acceleration*  
 SIAM Conference on Optimization, Seattle Jun 2023
- *Fast Algorithms for Regression Problems*  
 Institute for Theoretical Studies, ETH Zurich Mar 2023  
 Institut de Recherche en Informatique Fondamentale (IRIF), Paris Apr 2023  
 DFG Workshop on Optimization and Machine Learning, Berlin Jun 2023  
 The Institute of Mathematical Sciences, Chennai Jul 2023  
 Tata Institute for Fundamental Research, Mumbai Jul 2023  
 Simons Institute for Theory of Computation, Berkeley Nov 2023  
 Sorbonne University Dec 2023  
 Ecole Normale Supérieure, Paris Dec 2023
- *Fast Algorithms for  $\ell_p$ -Regression and Other Problems*  
 Toyota Technical Institute at Chicago Dec 2021  
 Theory Seminar, University of Michigan Mar 2022
- *Width-Reduced Methods for Quasi-Self-Concordant Optimization*  
 NeurIPS 2021, Virtual Conference Dec 2021  
 ETH Zurich Algorithms and Complexity seminar Oct 2021
- *Almost-linear-time Weighted  $\ell_p$ -norm Solvers in Graphs*  
 ICALP 2021, Virtual Conference Jul 2021
- *Fast Algorithms for  $\ell_p$ -regression*  
 Student Seminar, Dept. of Computer Science, Princeton University Oct 2019

- *Iterative Refinement for  $\ell_p$ -norms*  
Theory Group Talk, Dept. of Computer Science, University of Toronto Oct 2018
  - *Matching Under Preferences*  
Max Planck Institute for Informatics, Saarbrucken, Germany Jun 2017  
Indian Institute of Science Education and Research, Pune, India May 2017
  - *Inertial Particles on a Random and Vibrating Potential Energy Landscape*  
Indian Institute of Science Education and Research, Pune, India Sep 2015  
International Centre for Theoretical Sciences, Bangalore, India Jul 2015
- PROFFESIONAL EXPERIENCE
- **Institute for Advanced Study** Princeton, NJ, USA  
Visiting Student Fall 2019
  - **Department of Informatics, University of Bergen** Bergen, Norway  
Research Intern, Supervisor: Prof. Saket Saurabh Fall 2016
  - **The Institute of Mathematical Sciences** Chennai, India  
Research Intern, Supervisor: Prof. Saket Saurabh Summer 2016, Winter 2017
  - **International Centre for Theoretical Sciences** Bengaluru, India  
Research Intern, Supervisor: Prof. Samridhhi Sankar Ray Summer 2014, Summer 2015
- TEACHING EXPERIENCE
- **Teaching Assistant, University of Toronto**  
*CSC2421: Topics in Algorithms, Graduate Course* Winter 2021  
*CSC373: Algorithm Design and Analysis* Summer 2018, 2021; Winter 2018,  
*CSC304: Algorithmic game Theory and Mechanism Design* Fall 2018  
*CSC236: Theory of Computation* Summer 2019; Fall 2021  
*CSC336: Numerical Analysis* Winter, Summer, Fall 2020
- CODE CONTRIBUTION
- Julia and MATLAB implementations of our Algorithm pIRLS NeurIPS 2019
- PROFESSIONAL SERVICE
- Reviewer:  
FOCS(2018,2019,2020,2023), STOC(2019,2022,2023,2024,2025), SODA (2019,2023), NeurIPS(2019,2024), SAGT(2020), JMLR, ACDA(2023), SOSA (2024), ICALP(2024), ICLR(2025), PODC(2025)
- REFERENCES
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