Siddharth Gupta

Postdoctoral Researcher
Department of Computer Science
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Research Interests

Graph Algorithms and Computational Geometry, more specifically in Parameterized Complexity, Graph Drawing, Approximation Algorithms and, more recently, Fine-Grained Complexity and Combinatorial Reconfiguration.

Education

University of California, Irvine, USA

- Ph.D. in Computer Science, GPA 3.87/4.0 — Aug 2018
  Advisor: Prof. David Eppstein & Prof. Michael T. Goodrich
- M.S. in Computer Science, GPA 3.87/4.0 — Dec 2017

BITS-Pilani, Goa Campus, India

- M.Sc. in Mathematics, GPA 8.73/10.0 — Jun 2014
  Advisor: Prof. Ankit Agrawal & Prof. Tarkeshwar Singh
- B.E. in Computer Science, GPA 8.73/10.0 — Jun 2014

Professional Experience

- **University of Warwick, UK** — Oct 2021 - Oct 2023
  Postdoctoral Researcher (Advisor: Prof. Ramanujan Sridharan)
- **Ben-Gurion University, Israel** — Oct 2018 - Oct 2021
  Postdoctoral Researcher (Advisor: Prof. Meirav Zehavi)
- **INRIA, France** — Jun - Jul 2017
  Visiting Student Researcher (Host: Dr Laurent Viennot)
- **Northwestern University, USA** — Jun - Dec 2013
  Research Intern (Advisor: Prof. Ankit Agrawal)
- **Indian Institute of Science, India** — May - Jul 2012
  Research Intern (Advisor: Prof. L. Sunil Chandran)

Teaching Experience

Teaching Assistant at University of California, Irvine, USA

- Design and Analysis of Algorithms — Fall 2016
- Discrete Mathematics — Winter 2016, Spring 2016, Winter 2017
- Fundamentals of Algorithms with Applications — Fall 2017

Teaching Assistant at BITS-Pilani, Goa Campus, India

- Graph and Networks — Spring 2013
- Advanced Engineering Mathematics — Fall 2012
- Advanced Calculus — Fall 2011

Awards and Honors

- Zuckerman Postdoctoral Fellowship (awarded by Mortimer B. Zuckerman STEM Leadership Program) for the year 2018-2021.
- NSF Student Travel Grant for ACM SIGSPATIAL, 2016.
- Ranked 2nd in Department of Mathematics, BITS-Pilani, Goa Campus within a class of 33 students.
- Inspire Scholarship (awarded by Human Resource Department, Government of India) for the year 2009-2014.
- Selected for Financial Assistance for Paper Publication, a scholarship given by BITSAA (BITS Alumni Affair Division) to 3 students per year for Paper Publication.

Academic Services

- Reviewed zyBook (an interactive web-based textbook replacement) on Discrete Mathematics by Prof. Sandy Irani.
- **Conference Reviews:** GD 2022, ICTCS 2022, WG 2022, SWAT 2022, EuroCG 2022, WALCOM 2022, FCT 2021, ESA 2020, ISAAC 2019, GD 2019, MFCS 2019, GD 2018.
- **Journal Reviews:** Journal of Artificial Intelligence Research (JAIR) 2022, Information Processing Letters (IPL) 2021, 2022, Theoretical Computer Science (TCS) 2021, Journal of the ACM (JACM) 2021, Journal of Graph Algorithms and Applications (JGAA) 2020, 2022.

Publications (Alphabetical order of author's last name, except when marked with *)

Journal Publications

J2. G. Da Lozzo, D. Eppstein, M. T. Goodrich, and S. Gupta, "C-Planarity Testing of Embedded Clustered Graphs with Bounded Dual Carving-Width", Algorithmica, 2021. [**Special issue on IPEC 2019**]

J1. S. Gupta, G. Sa'ar, and M. Zehavi, "Parameterized Complexity of Motion Planning for Snake-Like Robots", Journal of Artificial Intelligence Research (JAIR), vol. 69, 2020. [**Invited to the Journal Track of IJCAI 2021**]

Conference and Workshop Publications

C14. J. Blum, Y. Disser, A. Feldmann, S. Gupta, and A. Zych-Pawlewicz, "On Sparse Hitting Sets: from Fair Vertex Cover to Highway Dimension", 17th International Symposium on Parameterized and Exact Computation (IPEC 2022).

C13. M. Balko, S. Chaplick, R. Ganian, S. Gupta, M. Hoffmann, P. Valtr, and A. Wolff, "Bounding and Computing Obstacle Numbers of Graphs", 30th European Symposium on Algorithms (ESA 2022).

C12. S. Gupta, M. Kumar, and S. Pai, "Brief Announcement: Distributed Reconfiguration of Spanning Trees", 24th International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS 2022).

C11. S. Gupta, G. Sa'ar, and M. Zehavi, "Grid Recognition: Classical and Parameterized Computational Perspectives", 32nd International Symposium on Algorithms and Computation (ISAAC 2021).

C10. D. Eppstein, S. Gupta, and E. Havvaei, "Parameterized Complexity of Finding Subgraphs with Hereditary Properties on Hereditary Graph Classes", 23rd International Symposium on Fundamentals of Computation Theory (FCT 2021).

C9. M. T. Goodrich, S. Gupta, Hadi Khodabandeh, and Pedro Matias, "How to Catch Marathon Cheaters: New Approximation Algorithms for Tracking Paths", 17th Algorithms and Data Structures Symposium (WADS 2021).

C8. S. Gupta and M. Zehavi, "Multivariate Analysis of Scheduling Fair Competitions", 20th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2021).

C7. G. Da Lozzo, D. Eppstein, M. T. Goodrich, and S. Gupta, "C-Planarity Testing of Embedded Clustered Graphs with Bounded Dual Carving-Width", 14th International Symposium on Parameterized and Exact Computation (IPEC 2019). [**Best Paper Award**]

C6. S. Gupta, G. Sa'ar, and M. Zehavi, "Parameterized Complexity of Motion Planning for Snake-Like Robots", 28th International Joint Conference on Artificial Intelligence (IJCAI 2019).

C5. S. Gupta, A. Kosowski, and L. Viennot, "Exploiting Hopsets: Improved Distance Oracles for Graphs of Constant Highway Dimension and Beyond", 46th International Colloquium on Automata, Languages and Programming (ICALP 2019).

C4. G. Da Lozzo, D. Eppstein, M. T. Goodrich, and S. Gupta, "Subexponential-Time and FPT Algorithms for Embedded Flat Clustered Planarity", 44th International Workshop on Graph-Theoretic Concepts in Computer Science (WG 2018).

C3. D. Eppstein and S. Gupta, "Crossing Patterns in Nonplanar Road Networks", 25th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL 2017).

C2. M. T. Goodrich, S. Gupta, and M. R. Torres, "A Topological Algorithm for Determining How Road Networks Evolve Over Time", 24th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL 2016).

***C1.** S. Gupta, D. Palsetia, M. Patwary, A. Agrawal, and A. Choudhary, "A New Parallel Algorithm for Two-Pass Connected Component Labeling", IEEE IPDPS Workshop on Multithreaded Architectures and Applications (MTAAP), 2014.

Workshops Attended

- Summer Workshop on Graph Drawing, 2022, Grosseto, Italy. [**Invitation based**]
- Algorithms Postdocs in Europe and Israel (AlgPiE), 2022, Bedlewo, Poland. [**Invitation based**]
- Bertinoro Workshop on Distributed Geometric Algorithms, 2022, Bertinoro, Italy. [**Invitation based**]
- Advanced Optimization for Social Choice, 2022, Lorentz Center - Snellius, Netherlands. [**Invitation based**]
- Combinatorial Reconfiguration, 2022, BIRS, Canada. [**Invitation based**]

- Bertinoro Workshop on Graph Drawing, 2022, Bertinoro, Italy. [**Invitation based**]
- Parameterized Complexity in Graph Drawing, 2021, Schloss Dagstuhl, Germany. [**Invitation based**]
- Algorithms Postdocs in Europe and Israel (AlgPiE), 2019, Bedlewo, Poland.
- Workshop on Kernelization (Worker), 2019, Bergen, Norway.
- Recent Advances in Parameterized Complexity, 2017, Tel Aviv, Israel.
- Research Promotion Workshop on Graph and Geometric Algorithms, 2013, Goa, India.
- Research Promotion Workshop on Graph and Geometric Algorithms, 2012, Surathkal, India.

Research Visits

- Visited Prof. Giordano Da Lozzo at Roma Tre University, Rome, Italy (Mar 17-28, 2022).
- Visited Prof. Giuseppe Francesco Italiano at LUISS Guido Carli University, Rome, Italy (Mar 22, 2022).
- Visited Prof. Nicola Prezza at Ca' Foscari University of Venice, Venice, Italy (Mar 14-15, 2022).