Pranabendu Misra

Postdoctoral Fellow

Department 1: Algorithms and Complexity,
Max Planck Institute for Informatics,
Campus E1 4, Saarland University
66123 Saarbrucken, Germany

https://pranabendu.bitbucket.io
EMAIL: pmisra@mpi-inf.mpg.de

Research Interests

Algorithms, Graph Theory, Parameterized Complexity, Approximation algorithms.

Other areas of interest

Network Design problems, Matching under Preferences, Matroids, Optimzation, Derandomization and Algebraic methods in algorithms.

Employment / Experience

Feb 2019 - present	Postdoctoral Fellow (Dept 1: Algorithms and Complexity), Max Planck Institute for Informatics, Saarbrucken, Germany.
July 2016 - Jan 2019	Researcher (Algorithms group), Department of Informatics, University of Bergen, Norway.

Education

Institute of Mathematical Sciences, HBNI, Chennai, India

June 2017	PhD in Computer Science. Thesis : Parameterized Algorithms for Network Design. Advisor: Dr. Saket Saurabh.

Chennai Mathematical Institute, Chennai, India

Aug 2012	M.Sc in Computer Science, Thesis : Some applications of the Regularity Lemma in Computer Science.
Aug 2010	B.Sc (Hons.) in Mathematics and Computer Science.

Journal Papers

1. *Polylogarithmic Approximation Algorithms for Weighted-$\mathcal{F}$-Deletion Problems*
   with Akanksha Agrawal, Daniel Lokshtanov, Saket Saurabh, and Meirav Zehavi
   TALG (ACM Transactions on Algorithms), 2020 (accepted).
   APPROX 2018 (Preliminary Version).

2. *Faster Graph bipartization.*
   with Sudeshna Kolay, M. S. Ramanujan and Saket Saurabh
   JCSS (Journal of Computing and System Sciences), 109: 45-55, **2020**.
   MFCS 2014 (Preliminary version in Conference Proceedings).

3. *Feedback Vertex Set Inspired Kernel for Chordal Vertex Deletion*
   with Akanksha Agrawal, Daniel Lokshtanov, Saket Saurabh and Meirav Zehavi.
   TALG (ACM Transactions on Algorithms), Volume 15(1): 11:1-11:28, 2019.
   SODA 2017 (Preliminary version in Conference Proceedings).

4. *Finding Even Subgraphs Even Faster.*
   with Prachi Goyal, Fahad Panolan, Geevarghese Philip and Saket Saurabh.
   JCSS (Journal of Computing and System Sciences), 97:1-13, 2018.
   FSTTCS 2015 (Preliminary version in Conference Proceedings).

5. *Deterministic Truncation of Linear Matroids.*
   with Daniel Lokshtanov, Fahad Panolan and Saket Saurabh.
   TALG (ACM Transactions on Algorithms), Volume 14(2):14:1-14:20, 2018.
   ICALP 2015 (Preliminary version in Conference Proceedings).

6. *Linear representation of transversal matroids and gammoids parameterized by rank*
   with Fahad Panolan, M.S.Ramanujan, Saket Saurabh
   Theoretical Computer Science, ISSN:0304-3975, 2018.
   COCOON 2017 (Preliminary version in Conference Proceedings).

7. *Hitting Selected (Odd) Cycles.*
   with Daniel Lokshtanov, M. S. Ramanujan and Saket Saurabh.
   SIDMA (SIAM Journal of Discrete Mathematics) 31(3):1581-1615, 2017.

8. *Faster Exact Algorithms for Some Terminal Set Problems.*
   with Rajesh H. Chitnis, Fedor V. Fomin, Daniel Lokshtanov, M. S. Ramanujan and Saket Saurabh.
   JCSS (Journal of Computing and System Sciences), 88:195-207, 2017.
   IPEC 2013 (Preliminary version in Conference Proceedings).

9. *Reducing Rank of the Adjacency Matrix by Graph Modification.*
   with S. M. Meesum and Saket Saurabh
   Theoretical Computer Science 654:70-79, 2016.
   COCOON 2015 (Preliminary version in Conference Proceedings).

10. *Faster Parameterized Algorithms for Deletion to Split Graphs*
    with Esha Ghosh, Sudeshna Kolay, Mrinal Kumar, Fahad Panolan, Ashutosh Rai and M. S. Ramanujan.
    Algorithmica 71(4):989-1006, 2015.
    SWAT 2012 (Preliminary version in Conference Proceedings).

11. *A polynomial kernel for Feedback Arc Set on bipartite tournaments.*
    with Venkatesh Raman, M.S. Ramanujan and Saket Saurabh.
    Theory of Computing Systems 53(4):609-620, 2013.
    ISAAC 2011 (Preliminary version in Conference Proceedings).

Conference Papers (without a journal version.)

12. *Strong Connectivity Augmentation is FPT*
    with Kristine Vitting Klinkby and Saket Saurabh
    SODA 2021 (**to appear**)

13. *FPT Approximation for FPT Problems*
    with Daniel Lokshtanov, MS Ramanujanm, Saket Saurabh and Meirav Zehavi
    SODA 2021 (**to appear**)

14. *A $(2 + \varepsilon)$ approximation algorithm for Split Vertex Deletion*
    with Daniel Lokshtanov, Fahad Panolan, Geevarghere Philip and Saket Saurabh
    ICALP 2020.

15. *An Exponential Time Parameterized Algorithm for Planar Disjoint Paths*
    with Daniel Lokshtanov, Michal Pilipczuk, Saket Saurabh and Meirav Zehavi
    STOC 2020.

16. *2-Approximating Feedback Vertex Set in Tournaments*
    with Daniel Lokshtanov, Joydeep Mukherjee, Geevarghese Philip, Fahad Panolan and Saket Saurabh
    SODA 2020.

17. *Fault Tolerant Subgraphs with Applications in Kernelization*
    with William Lochet, Daniel Lokshtanov, Saket Saurabh, Roohani Sharma and Meirav Zehavi
    ITCS 2020.

18. *On the Complexity of Recovering Incidence Matrices*
    with Ramanujan M. S., Petr Golovach and Fedor Fomin
    ESA 2020.

19. *Quick Separation in Chordal and Split Graphs*
    with Fahad Panolan, Ashutosh Rai, Saket Saurabh and Roohani Sharma
    MFCS 2020.

20. *Popular Matching in the Roommates Setting is NP-hard*
    with Sushmita Gupta, Saket Saurabh, and Meirav Zehavi
    SODA 2019, Pages 1711-1730.

21. *Interval Vertex Deletion Admits a Polynomial Kernel*
    with Akanksha Agrawal, Saket Saurabh, and Meirav Zehavi
    SODA 2019, Pages 1711-1730.

22. *An Erdos–Posa Theorem on Neighborhoods and Domination Number*
    with Jayakrishnan Madathil and Saket Saurabh
    COCOON 2019, Pages 437-444.

23. *Sub-exponential Time Parameterized Algorithms for Graph Layout Problems on Digraphs with Bounded Independence Number*
    with Roohani Sharma, Saket Saurabh and Meirav Zehavi
    FSTTCS 2018, Pages 35:1-35:19.

24. *Exploring the Kernelization Borders for Hitting Cycles*
    with Akanksha Agrawal, Pallavi Jain, Lawqueen Kanesh and Saket Saurabh
    IPEC 2018, Pages 14:1-14:14.

25. *An FPT Algorithm for Contraction to Cactus.*
    with R. Krithika and Prafullkumar Tale.
    COCOON 2018, Pages 341-352.

26. *Conflict Free Version of Covering Problems on Graphs: Classical and Parameterized*
    with Pallavi Jain and Lawqueen Kanesh
    CSR 2018, Pages 194-206.

27. *Erdos-Posa Property of Obstructions to Interval Graphs*
    with Akanksha Agrawal, Daniel Lokshtanov, Saket Saurabh, and Meirav Zehavi
    STACS 2018, Pages 7:1-7:15.

28. *Quasipolynomial Representation of Transversal Matroids with Applications in Parameterized Complexity*
    with Daniel Lokshtanov, Fahad Panolan, Saket Saurabh and Meirav Zehavi
    ITCS 2018, Pages 32:1-32:13 .

29. *Parameterized Algorithms for Survivable Network Design with Uniform Demands*
    with Joergen Bang-Jensen, Manu Basavaraju, Kristine Vitting Klinkby, Ramanujan M. S., Saket Saurabh and Meirav Zehavi
    SODA 2018, Pages 2830-2850.

30. *Fast Exact Algorithms for Survivable Network Design with Uniform Requirements.*
    with Akanksha Agarwal, Fahad Panolan and Saket Saurabh.
    WADS 2017, Pages 25-36.

31. *Lossy Kernels for Graph Contraction Problems*
    with R Krithika, Ashutosh Rai and Prafullkumar Tale.
    FSTTCS 2016 Pages 23:1-23:14.

32. *Parameterized Algorithms to Preserve Connectivity.*
    with Manu Basavaraju, Fedor V. Fomin, Petr A. Golovach, M. S. Ramanujan and Saket Saurabh.
    ICALP 2014 Pages 800-811.

33. *Parameterized Algorithms for Even Cycle Transversal*
     with Venkatesh Raman, M.S. Ramanujan and Saket Saurabh.
     WG 2012, <small>Pages 172-183.</small>

Manuscripts

34. *Deterministic Representation of Gammoids in Quasipolynomial time with Applications*
     with Rohit Gurjar, Daniel Lokshtanov, Fahad Panolan, Saket Saurabh and Meirav Zehavi

35. *On Fault Tolerant Feedback Vertex Set*

36. *A Brief Note on Single Source Fault Tolerant Reachability*
     with Daniel Lokshtanov, Saket Saurabh and Meirav Zehavi

37. *ETH-Tight Algorithm for Bidirected Steiner Connectivity*
     with Daniel Lokshtanov, Fahad Panolan, Saket Saurabh and Meirav Zehavi

38. *Parameterized Complexity of Directed Spanner Problems*
     with Fedor Fomin, Petr Golovach, William Lochet, Saket Saurabh and Roohani Sharma

TEACHING

SUMMER 2020 (May to July) Online Lectures in English	*Parameterized Algorithms*. Max Planck Institute for Informatics, Saarbrucken, Germany. jointly taught with Dr. Daniel Marx.
SUMMER 2019 (April to July) Lectures in English	*Distributed and Sequential Graph Algorithms*. Max Planck Institute for Informatics, Saarbrucken, Germany. jointly taught with Dr. Saeed Amiri.

TEACHING ASSISTANT / GUEST LECTURER

Guest Lecturer for INF 334 Advanced Algorithms at University of Bergen, Autumn 2018 and 2017; Guest Lecturer for Parameterized Complexity at IMSc, Spring 2015 and 2016, and Teaching Assistant for Fall 2012; Guest Lecturer for Kernelization at IMSc, Spring 2011; Tutorial Sessions for Advanced School on Parameterized Algorithms and Kernelization (ASPAK) 2014.

PROFESSIONAL SERVICE

Program Committee member for IPEC 2020.

Reviewer for conferences and journals such as SODA, ICALP, ESA, WG, IPEC, FSTTCS, MFCS, ISAAC, ACM Transactions on Algorithms(TALG), SIAM Journal on Computing(SICOMP), Algorithmica, Discrete Applied Mathematics, Theoretical Computer Science, JCSS, SIAM Journal on Discrete Mathematics(SIDMA), Information Processing Letters(IPL).

Jun 2019	Invited Talk at WORKER (Workshop on Kernelization) 2019, Bergen, Norway. Title: A polynomial kernel for Interval Vertex Deletion.
Jan 2019	Talk at TIFR, Mumbai. Title: Parameterized Complexity of Network Design Problems.
Jan 2019	Talk at IIT Gandhinagar, Ahmedabad. Title: Parameterized Complexity of Network Design Problems.
Dec 2018	Talk at Chennai Mathematical Institute, Chennai. Title: Parameterized Complexity of Network Design Problems.
Sep 2018	Invited Talk at FPT OR Workshop, Solstrand, Norway. Title: Popular Matching in Roommates Setting is NP-hard.
Aug 2018	Invited Talk at China-Norway FPT Workshop, Bergen, Norway. Title: Popular Matching in Roommates Setting is NP-hard.
Feb 2018	Conference Talk at STACS 2018, Caen, France.
Jun 2017	Conference Talk at WADS 2017, St. John's, NL, Canada.
Jan 2017	Research Visit to the Hong Kong Polytechnic University, Hong Kong, China.
Dec 2016	Conference Talk at FSTTCS 2016, Chennai, India.
Dec 2015	Conference Talk at FSTTCS 2015, Bangalore, India.
May - Oct 2015	Visitor at the Bergen Algorithms Research Group, Department of Informatics, University of Bergen, Norway.
Sep - Oct, 2013	Visitor at the Bergen Algorithms Research Group, Department of Informatics, University of Bergen, Norway.
Sep 2013	Conference Talk at IPEC 2013, Sophia Antipolis, France.
Aug 2013	Visitor at the Algorithms and Complexity Group, Max-Planck-Institut für Informatik, Saarbrücken, Germany.
Dec 2011	Conference Talk at ISAAC 2011, Yokohama, Japan.

References

Available on request.