Shreyas Pai

Contact Information

E-mail: shreyas.pai@aalto.fi
Phone: +358 504737201 (M) +91 9833669064 (Whatsapp)
Website: `https://shreyaspai.com`

Research Interests

My research interests are primarily in Theory of Distributed and Parallel Computing, more specifically in Distributed Graph Algorithms and Algorithms for Large Data. I am also more generally interested in topics in Theoretical Computer Science like Communication Complexity and Combinatorial Optimization.

Professional Experience

- Postdoctoral Researcher — Aug 2021 – present
  Aalto University, Finland
  Host: Jara Uitto.
- Research Assistant — Aug 2017 – May 2019
  The University of Iowa, USA
  Computational Epidemiology Group

Education

- PhD and MS in Computer Science — Aug 2016 – May 2021
  The University of Iowa, USA
  Advisor: Sriram V. Pemmaraju. CGPA: 4.07/4
- B.Tech in Computer Engineering — Aug 2017 – May 2019
  Veermata Jijabai Technological Institute, India
  CGPA: 8.13/10

Manuscripts

1. *Constant Time Parallel Almost Maximal Independent Set with Applications to Correlation Clustering and Ruling Sets*, (under review)
   with Mélanie Cambus, Fabian Kuhn, Etna Lindy, and Jara Uitto.
2. *Message Complexity of Distributed Approximation*, (under review)
   with Fabien Dufoulon, Gopal Pandurangan, Sriram Pemmaraju, and Peter Robinson.
3. *Fast Dynamic Programming in Trees in the MPC Model*, (under review)
   with Chetan Gupta, Rustam Latypov, Yannic Maus, Simo Särkkä, Jan Studený, Jukka Suomela, Jara Uitto, and Hossein Vahidi.
4. *Faster Set Cover in the MPC Model*,
   with Hongyan Ji, Sriram Pemmaraju, and Joshua Sobel.

Conference Publications

1. *Sinkless Orientation Made Simple*
   Alkida Balliu, Janne H. Korhonen, Fabian Kuhn, Henrik Lievonen, Dennis Olivetti, Shreyas Pai, Ami Paz, Joel Rybicki, Stefan Schmid, Jan Studený, Jukka Suomela, and Jara Uitto
   Symposium on Simplicity in Algorithms SOSA 2023 pp. 175–191
2. *Brief Announcement: Distributed Reconfiguration of Spanning Trees*
   Siddharth Gupta, Manish Kumar, and Shreyas Pai
   Stabilization, Safety, and Security of Distributed Systems, SSS 2022 pp. 346–351
3. *Brief Announcement: Deterministic Massively Parallel Algorithms for Ruling Sets*
   Shreyas Pai and Sriram V. Pemmaraju
   ACM Symposium on Principles of Distributed Computing, PODC 2022 pp. 366–368

4. *Risk-aware Temporal Cascade Reconstruction to Detect Asymptomatic Cases : For the CDC MInD Healthcare Network*
   Hankyu Jang, Shreyas Pai, Bijaya Adhikari, and Sriram V. Pemmaraju
   IEEE International Conference on Data Mining, ICDM 2021 pp. 240–249
5. *Can We Break Symmetry with o(m) Communication?*
   Shreyas Pai, Gopal Pandurangan, Sriram V. Pemmaraju, and Peter Robinson
   ACM Symposium on Principles of Distributed Computing, PODC 2021 pp. 247–257
6. *Sample-And-Gather: Fast Ruling Set Algorithms in the Low-Memory MPC Model*
   Kishore Kothapalli, Shreyas Pai, and Sriram V. Pemmaraju
   IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science, FSTTCS 2020 pp. 28:1–28:18
7. *Connectivity Lower Bounds in Broadcast Congested Clique*
   Shreyas Pai and Sriram V. Pemmaraju
   IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science, FSTTCS 2020 pp. 32:1–32:17
8. *Distributed Approximation on Power Graphs*
   Reuven Bar-Yehuda, Keren Censor-Hillel, Yannic Maus, Shreyas Pai, and Sriram V. Pemmaraju
   ACM Symposium on Principles of Distributed Computing, PODC 2020 pp. 501–510
9. *Spatiotemporal clustering of in-hospital Clostridioides difficile infection*
   Shreyas Pai, Philip M. Polgreen, Alberto Maria Segre, Daniel K. Sewell, and Sriram V. Pemmaraju
   Infection Control and Hospital Epidemiology 2020 pp. 418–424
10. *A Constant Approximation for Colorful k-Center*
    Sayan Bandyapadhyay, Tanmay Inamdar, Shreyas Pai, and Kasturi R. Varadarajan
    Annual European Symposium on Algorithms, ESA 2019 pp. 12:1–12:14
11. *Brief Announcement: Connectivity Lower Bounds in Broadcast Congested Clique*
    Shreyas Pai and Sriram V. Pemmaraju
    ACM Symposium on Principles of Distributed Computing, PODC 2019 pp. 256–258
12. *Large-Scale Distributed Algorithms for Facility Location with Outliers*
    Tanmay Inamdar, Shreyas Pai, and Sriram V. Pemmaraju
    International Conference on Principles of Distributed Systems, OPODIS 2018 pp. 5:1–5:16
13. *Near-Optimal Clustering in the k-machine model*
    Sayan Bandyapadhyay, Tanmay Inamdar, Shreyas Pai, and Sriram V. Pemmaraju
    ACM International Conference on Distributed Computing and Networking, ICDCN 2018 pp. 15:1–15:10
14. *Symmetry Breaking in the CONGEST Model: Time- and Message-Efficient Algorithms for Ruling Sets*
    Shreyas Pai, Gopal Pandurangan, Sriram V. Pemmaraju, Talal Riaz, and Peter Robinson
    International Symposium on Distributed Computing, DISC 2017 pp. 38:1–38:16
15. *Brief Announcement: Symmetry Breaking in the CONGEST Model: Time- and Message-Efficient Algorithms for Ruling Sets*
    Shreyas Pai, Gopal Pandurangan, Sriram V. Pemmaraju, Talal Riaz, and Peter Robinson
    ACM Symposium on Principles of Distributed Computing, PODC 2017 pp. 207–209

Journal Publications

1. *Risk-aware temporal cascade reconstruction to detect asymptomatic cases*
   Hankyu Jang, Shreyas Pai, Bijaya Adhikari, and Sriram V. Pemmaraju
   Knowledge and Information Systems 2022 pp. 3373–3399

2. *Near-optimal clustering in the* k*-machine model*
Sayan Bandyapadhyay, Tanmay Inamdar, Shreyas Pai, and Sriram V. Pemmaraju
Theoretical Computer Science 2022 pp. 80–97

Note: Conference Publications 4, 9, and Journal Publication 1 have authors in order of contribution, and all others have authors in alphabetical order of last name.

Fellowships

- Ballard Seashore Fellowship, Spring 2021
- Graduate College Summer Fellowship, Summer 2020 and 2019
- Graduate College Post Comprehensive Fellowship, Fall 2019

Teaching Experience

- **Instructor**:
Algorithms (Spring 2017) (`https://homepage.cs.uiowa.edu/~sriram/3330/spring17`)
- **Teaching Assistant:**
Principles of Algorithmic Techniques (Fall 2021/2022),
Theory of Computation (Spring 2020),
Computer Science 1: Fundamentals (Fall 2016)

Invited Talks

- Algorithmic Lovasz Local Lemma
Guest Lecture at *Program in Algorithmic and Combinatorial Thinking* July 2021
- Sample-And-Gather: Fast Ruling Set Algorithms in the Low-Memory MPC Model
Talk at *Helsinki Theory Seminar* October 2020
- Introduction to Distributed Algorithms (MIS and 3-Coloring Directed Rooted Trees)
Guest Lectures at *Program in Algorithmic and Combinatorial Thinking* July 2017

Summer Activities

- Research Internship at *Technion Israel Institute of Technology*, Haifa — May – July 2019
Host: Keren Censor-Hillel.
- Research Internship at *Indian Institute of Science*, Bangalore — May – July 2016
Host: Siddharth Barman
- Program in Algorithmic and Combinatorial Thinking at *Princeton University* — June – Aug 2015
Focus: Machine Learning
- Program in Algorithmic and Combinatorial Thinking at *Princeton University* — June – Aug 2014
Focus: Randomized Algorithms

Academic Service

- **Conference Reviewer:**
ACM-SIAM Symposium on Discrete Algorithms (SODA).
ACM Symposium on Principles of Distributed Computing (PODC).
ACM Symposium on Parallelism in Algorithms and Architecture (SPAA).
International Symposium on Distributed Computing (DISC).
International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS).
Foundations of Software Technology and Theoretical Computer Science (FSTTCS).
International Conference on Distributed Computing and Networking (ICDCN).
International Colloquium on Structural Information and Communication Complexity (SIROCCO).
Conference on Principles of Distributed Systems (OPODIS).
- **Journal Reviewer:**
Distributed Computing (DIST).
Theoretical Computer Science (TCS).
Journal of Parallel and Distributed Computing (JPDC).

- **Program Committee Member:**
  International Conference on Distributed Computing and Networking (ICDCN) 2022.
  International Conference on Distributed Computing and Intelligent Technology (ICDCIT) 2023
- **Other:**
  Co-Organizer for 1st Workshop on Algorithms for Massive Graphs (AMG) in DISC 2022
  Co-Organizer for Meet other Postdocs and Students (MoPS) in DISC 2020 and 2021