Sagar Kale **Ph.D. in Computer Science**

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Currently in Austria on Work Permit.

PROFILE / SKILLS

–Strong theoretical foundation of algorithms, and ~4 years of software engineering experience
–Proficient in Java; experienced in SQL, Python, Linux, PHP, JavaScript
–Comfortable in machine learning and data-science libraries (numpy, pandas, tensorflow, etc.)

EDUCATION / POSTDOC

Degree	Institute/University	Year/Grades
Postdoc	University of Vienna	2019-
Postdoc	École polytechnique fédérale de Lausanne	2017–2019
Ph.D.	Dartmouth College	2012–2017
M.Tech.	Indian Institute of Technology Bombay	2009–2011; CPA 9.25/10
B.E. (Mechanical)	University of Mumbai	2006; First Class

WORK/CODING EXPERIENCE

Software Engineer July 2006 – June 2009 (India), Nov 2011 – August 2012 (USA)

- Java: development/maintenance of Java EE web applications for health insurance companies. Passed Sun Java certification exam (SCJP5) along the way with 94%.
  - IBM/DB2, PL/SQL: Testing stored procedures.
  - JSP, Servlets, Spring Framework, IBM/DB2, Eclipse: handled requirement gathering, design, development, test design, and testing of several modules successfully for a leading USA health-insurance company.
  - Designed and developed an internal web application using Java EE, AJAX, and Spring Framework completely by myself.
- Python: development of a test automation tool (in USA, for a leading telecom company).

During PhD: Designed and implemented the internal course registration web application using PHP and SQLite for the computer science department at Dartmouth completely by myself.
Hash Code 2019: 83rd rank in the extended online round and 334th in the main online round.

RESEARCH SUMMARY

The advent of big data necessitated design of algorithms that could cope with it. My research theme has been on the following multiple ways to handle big data:

- *Streaming algorithms* process their input sequentially and use a small amount of working memory.
- *Parallel computation:* e.g., frameworks such as *MapReduce*.
- *Coresets* small and representative summary of big data.

My research has been on clustering and graph problems with recent focus on fairness in algorithms.

PUBLICATIONS

Note: the authors are listed in **alphabetical order** of the last names.

1. To appear in **ESA 2020**; Monika Henzinger and Sagar Kale. *Fully-Dynamic Coresets.*
2. To appear in **ICML 2020**; Ashish Chiplunkar, Sagar Kale, and Sivaramakrishnan Natarajan Ramamoorthy. *How to Solve Fair* k*-Center in Massive Data Models.*
3. In **ICALP 2020**; Paritosh Garg, Sagar Kale, Lars Rohwedder, and Ola Svensson. *Robust Algorithms under Adversarial Injections.*

4. In **APPROX 2019**; Sagar Kale. *Small space stream summary for matroid center.*
5. In **PODC 2019**; Buddhima Gamlath, Sagar Kale, Slobodan Mitrović, and Ola Svensson. *Weighted matchings via unweighted augmentations.*
6. In **SODA 2019**; Buddhima Gamlath, Sagar Kale, and Ola Svensson. *Beating greedy for stochastic bipartite matching.*
7. In **APPROX 2017**; Sagar Kale and Sumedh Tirodkar. *Maximum matching in two, three, and a few more passes over graph streams.*
8. In **FOCS 2016**; Amit Chakrabarti and Sagar Kale. *Strong fooling sets for multi-player communication with applications to deterministic estimation of stream statistics.*
9. In **IPCO 2014** and journal version in **Mathematical Programming B**; Amit Chakrabarti and Sagar Kale. *Submodular maximization meets streaming: matchings, matroids, and more.*

COURSES TAKEN

During Ph.D: Writing, Presenting, and Evaluating Technical Papers in Computer Science, Random Walk on a Graph, Advanced Algorithms, Computational Complexity, **Machine Learning and Statistical Data Analysis**, Concurrent Algorithms, Numerical and Computational Tools for Applied Science, Communication Complexity, Data Stream Algorithms, and Advanced Operating Systems.

During M.Tech: Algorithms, Combinatorics, Linear Optimization, Approximation Algorithms, Integer Programming, Introduction to Probability and Linear Algebra, Special Topics in Automata and Logics, Pattern Recognition, Fundamental Algorithms in Computational Biology, **Artificial Intelligence**, Software Lab, and Applied Economics.

PROFESSIONAL SERVICE

- Program committee member of ESA 2019.
- Subreviewer for the conferences: APPROX'14, SODA'15, SODA'16, STOC'16, FOCS'16, CCC'17, ESA'17, ICALP'18, ESA'18, SODA'19,

ACHIEVEMENTS

- All India Rank 71 (99.82 percentile) among 43,170 candidates in Graduate Aptitude Test in Engineering (GATE) 2009.
- Sun Certified Programmer for Java 5.0 (SCJP) — cleared with 94%.

INVITED VISITS AND TALKS

- Long-term participant of the program "Theoretical Foundations of Big Data Analysis" at Simons Institute (at Berkeley, CA, USA) during Fall 2013.
  https://simons.berkeley.edu/programs/bigdata2013
- Invited talk at the "Communication Complexity and Applications, II (17w5147)" workshop at Banff International Research Station (BIRS), Banff, AB, Canada.
  https://www.birs.ca/events/2017/5-day-workshops/17w5147
- Invited day-long visits to TIFR and UMass Amherst.
- Invited talk on the FOCS'16 paper at IITB, TIFR, and UMass Amherst.

REFERENCES

1. Prof. Amit Chakrabarti, Professor, Dartmouth College, amit.chakrabarti@dartmouth.edu
2. Prof. Ola Svensson, Associate Professor, EPFL, ola.svensson@epfl.ch
3. Prof. Monika Henzinger, Professor, University of Vienna, monika.henzinger@univie.ac.at