# Siddhartha **Jain**

COMPUTER SCIENCE @ EPFL · ALGORITHMS · COMPLEXITY THEORY

✉ siddhartha.jain@epfl.ch | 🏠 sidjain.me | ⌨ siddjai | in siddjai21

*"Somewhere, something incredible is waiting to be known."*
*Carl Sagan*

## Education

### EPFL
École Polytechnique Fédérale de Lausanne                                    *Lausanne, Switzerland*

M.S. IN COMPUTER SCIENCE                                                    *Sep 2020 - Present*

- MSc Research Scholar
- **Relevant Courses**: Machine Learning, Advanced Algorithms, Learning Theory, Probabilistic Methods in Combinatorics, Spectral Graph Algorithms

### IIIT-Delhi
Indraprastha Institute of Information Technology, Delhi                      *New Delhi, India*

B.TECH IN COMPUTER SCIENCE & APPLIED MATHEMATICS                            *Aug 2016 - Aug 2020*

- Cumulative GPA 9.1/10, Major GPA 9.3/10
- Founded the Math club (Évariste)

## Skills

| | |
|---|---|
| **Presentation** | LaTeX, Illustrator |
| **Programming** | Python, Mathematica, Julia, C++, Java |
| **Languages** | English, Hindi, French |

## Experience

### MSc Research Scholar                                                     *Lausanne, Switzerland*
EPFL                                                                        *Feb 2021 - Jan 2022*

- Working with Mika Göös.

### Research Intern                                                         *Shanghai, China*
ITCS @ SHANGHAI UNIVERSITY OF FINANCE & ECONOMICS                           *May 2019 - Jul 2019*

- Hosted by Bundit Laekhanukit.
- Proved a theorem about the inapproximability of a **graph compression** problem. The paper can be found on ArXiv.

### Teaching Assistant                                                      *New Delhi, India*
IIIT-DELHI                                                                  *Aug 2018 - Nov 2018*

- Course: Discrete Structures.

## Projects

### Unambiguous DNFs                                                        *Boolean Functions*
SEMESTER PROJECT AT EPFL                                                    *Sep 2020 - Jan 2021*

- Supervisor: Mika Göös, Collaborators: Shalev Ben-David (UWaterloo), Robin Kothari (Microsoft Research)
- We exhibit an unambiguous $k$-DNF formula that requires CNF width $\widetilde{\Omega}(k^{1.5})$. Our result is known to imply several other improved separations in query and communication complexity.
- **Paper in submission**. [ECCC] [arXiv]

### Clustering                                                              *Clustering*
PAPER: INCLUDING OUTLIER PERSPECTIVE LEADS TO BETTER CLUSTERING             *2020*

- Co-authors: Shay Ben-Elazar, Vincent Cohen-Addad, Karthik CS
- We propose a completely new paradigm for preprocessing data in an unsupervised manner to improve the performance of clustering algorithms, inspired by **Error-Correcting Codes** and **Locality Sensitive Hashing**.
- In writing.

### Algorithms for Big Data

Algorithms

Independent Study at IIIT-Delhi

Aug 2019 - Dec 2019

- Supervisor: Rajiv Raman
- Studied various topics related to Algorithms for Big Data and presented it to my supervisor, peers and other researchers visiting or working at IIIT-Delhi.

### Guillotine Cuts & Pattern Avoidance in Permutations

Combinatorics

Bachelor Thesis at IIIT-Delhi

Mar 2018 - Mar 2019

- Advisors: Rajiv Raman, Samrith Ram
- Worked on a combinatorial conjecture on Guillotine Cuts for Axis Parallel Rectangles, which would imply a polytime $O(1)$ approximation algorithm for MISR, as presented in On Guillotine Cutting Sequences [Abed, Chalermsook et al].
- We found an interesting connection to Pattern Avoidance in Permutations, and posed our own conjecture along with a few results.

## Honors & Awards

| 2021 | **MSc Research Scholar**, EPFL | Lausanne, Switzerland |
| 2020 | **Graduation with Honors**, IIIT-Delhi | New Delhi, India |
| 2019 | **Dean's List**, IIIT-Delhi | New Delhi, India |

## Workshops & Schools

### Mathematics of Quantum Computation

Jerusalem, Israel

Israel Institute for Advanced Studies

Dec 2019

### Mathematics for Data Science

Bangalore, India

Indian Institute of Science

Jul 2019

### Graph Theory & Graph Algorithms

Gandhinagar, India

Indian Institute of Technology, Gandhinagar

Jun 2017

## Extracurricular Activity

### Évariste (Math Club of IIIT-Delhi)

New Delhi, India

Founder

Aug 2017

- 40+ active members, 8 innovative events per semester.
- Organised Convergence along with Math dept of IIIT-Delhi.

### Student Senate of IIIT-Delhi

New Delhi, India

Representative

Apr 2018 - Aug 2019

- Represented CSAM Batch of 2016 in the Senate.
- Represented entire student body in the Disciplinary Action Committee.