

# Sagnik Chatterjee

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## Biography

I am a Ph.D. student in the [BraQIIT](#) lab at IIIT-Delhi, where I am very fortunate to be advised by [Prof. Debajyoti Bera](#). My research lies at the intersection of [quantum computing](#) and [learning theory](#).

## Education

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|-----------------------------------------------------------------|--------------------------------------------------------------------------------|
| JUL '19 - present<br>Ph.D. in Computer Science                  | Indraprastha Institute of Information Technology, Delhi (IIIT-D)<br>CGPA: 8.78 |
| AUG '13 - AUG '17<br>B.Tech in Computer Science and Engineering | Maulana Abul Kalam Azad University of Technology, Kolkata<br>CGPA: 8.10        |

## Research Internships

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| JUL '23 - present<br>Quantum Learning Theory | Czech Technical University, Prague (CTU)<br>Supervised by Vyacheslav Kungurtsev |
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## Research

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| JUL '23<br>Submitted                    | Quantum Solutions to the Privacy vs. Utility Tradeoff<br><i>Sagnik Chatterjee, Vyacheslav Kungurtsev</i>                                 |
| MAY '23<br>Submitted                    | Efficient Quantum Agnostic Improper Learning of Decision Trees<br><i>Sagnik Chatterjee, Tharmashastha SAPV, and Debajyoti Bera</i>       |
| AUG '22<br>QUANTUM MACHINE INTELLIGENCE | Quantum Boosting using Domain-Partitioning Hypotheses<br><i>Sagnik Chatterjee, Rohan Bhatia, Parmeet Singh Chani, and Debajyoti Bera</i> |
| JUL '23<br><a href="#">pre-print</a>    | Applying the Quantum Alternating Operator Ansatz to the Graph Matching Problem<br><i>Sagnik Chatterjee, Debajyoti Bera</i>               |

## Invited Talks

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|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------|
| Quantum Boosting using Domain-Partitioning Hypotheses                                       | IIIT-D CSE Seminar<br>QTML 2022 (Naples, Italy)<br>IIIT-D Theory Seminar   | FEB'23<br>NOV'22<br>MAR'22 |
| Spectral properties of Random Graphs (3 lectures)<br>Hoffman's Chromatic Number Lower Bound | Spectral Graph Theory Reading Group<br>Spectral Graph Theory Reading Group | JUN'23<br>JUN'23           |
| Improved Quantum Query Upper Bounds via Decision Trees                                      | IIIT-D Theory Reading Group                                                | MAY'23                     |
| Applying QAOA+ to the Graph Matching Problem                                                | QISE Workshop                                                              | DEC'21                     |
| Quantum Shallow Circuits                                                                    | T-talk at Évariste(IIIT Math Club)                                         | OCT'20                     |
| Quantum Algorithms for Linear Systems of Equations                                          | IIAS 4th CSE Winter School                                                 | DEC'19                     |
| Quantum Machine Learning                                                                    | FDP at JNTU, Anantapur<br>Delhi Quantum Computing Meetup                   | DEC'20<br>FEB'20           |

## Teaching

|                         |            |                                   |
|-------------------------|------------|-----------------------------------|
| IIIT-D Winter Semester  | 2023       | Introduction to Quantum Computing |
| IIIT-D Refresher Module | 2022       | Introduction to C Programming     |
| IIIT-D Summer Semester  | 2022       | Data Structures and Algorithms    |
| IIIT-D Winter Semester  | 2020, 2021 | Theory of Computation             |
| IIIT-D Monsoon Semester | 2020, 2021 | Modern Algorithm Design           |

## Selected Extra-Curricular Activities

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| AUG'22-<br>DEC'22 | Organizer and coordinator for Ketchup talks, at IIIT Delhi.<br><a href="https://twitter.com/KetchupIIITD">https://twitter.com/KetchupIIITD</a> .                                                             |
| DEC '21           | Only student organizer for the QISE'21 workshop.<br><a href="https://acm-go.a.github.io/QISE/">https://acm-go.a.github.io/QISE/</a> .                                                                        |
| FEB '20           | Student organizer for the Indo-German Spring School on Algorithms for Big Data 2020, at IIIT-Delhi.<br><a href="https://sites.google.com/view/abd2020/home">https://sites.google.com/view/abd2020/home</a> . |
| FEB '20           | Organized the first India Quantum Computing Meetup in New Delhi.<br><a href="https://sites.google.com/iiitd.ac.in/indiaqcmeetup/home">https://sites.google.com/iiitd.ac.in/indiaqcmeetup/home</a> .          |

## Workshops and Schools

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| JTG/IEEE ITSoc Summer School 2023                                                                 | IISc Bangalore |
| Quantum Information Science and Engineering 2022                                                  | Online         |
| Indo-German Spring School on ALgorithms for Big Data 2020                                         | IIIT Delhi     |
| Sensitivity, Query Complexity, Communication Complexity and Fourier Analysis of Boolean Functions | ISI Kolkata    |
| The 4th Advanced School in Computer Science and Engineering                                       | IAS Jerusalem  |

## Industry Experience

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| <b>Oracle Financial Services Software Limited</b> |                                                                                                                                                                                                   |
| NOV '18 to MAR '19                                | <b>Staff Consultant:</b> Developed data models and automated report generation during EOD operations. Bank successfully went live in December 2018.                                               |
| SEP '17 to OCT '18<br><i>Technology Stack</i>     | <b>Associate Consultant:</b> Customized the business logic of our core product FCUBS.<br>FLEXCUBE, BI-Publisher, JAVA, JSP, Weblogic, JS, SOAP, Spring, Hibernate, Oracle 12c, SQL.               |
| <b>Infosys Limited</b>                            |                                                                                                                                                                                                   |
| FEB'17 TO MAY'17<br><i>Technology Stack</i>       | <b>Systems Engineering Intern (Full Stack Developer):</b> Agile methodology.<br>JAVA, Weblogic, Angular, REST, Spring, Hibernate ORM, Oracle 12c, SQL, PL/SQL.                                    |
| <b>AlCircle Pte Ltd</b>                           |                                                                                                                                                                                                   |
| SUMMER 2016<br><i>Technology Stack</i>            | <b>Data-Analyst Intern (Python Application Developer):</b> Created an application to source content for the editorial team. Crawler+Database Insertion+Automated Updates.<br>Python, MySQL, REST. |

## References

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|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dr. Debajyoti Bera        | Associate Professor, Department of Computer Science,<br>Indraprastha Institute of Information Technology (IIIT) Delhi<br><b>Email:</b> dbera@iiitd.ac.in |
| Dr. Rohit Vaish           | Assistant Professor, Department of Computer Science,<br>Indian Institute of Technology (IIT) Delhi<br><b>Email:</b> rvaish@iitd.ac.in                    |
| Dr. Vyacheslav Kungurtsev | Researcher, Faculty of Computer Science and Engineering (FEL)<br>Czech Technical University (CVUT)<br><b>Email:</b> kunguvya@fel.cvut.cz                 |