Sagnik Chatterjee

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Research Areas and Interests

- Quantum algorithms and statistical learning theory; with an emphasis on learning w.r.t. various noise models, and proving theoretical bounds for convergence, generalization error, and speedups.

Employment

Dec 25 – Present — **Visiting Fellow (Postdoctoral Researcher)** at STCS, TIFR Mumbai.
Host: Prof. Jatin Batra.

Sep 17 – Mar 19 — **Staff Consultant,** Oracle Financial Services Software Limited, Bangalore.

Education

Jul 2019 – Jun 2025 — **Ph.D.** in Computer Science and Engineering.
Advisor: Prof. Debajyoti Bera.
Indraprastha Institute of Information Technology, Delhi (IIIT-Delhi).

Aug 2013 – Aug 2017 — **B.Tech.** in Computer Science and Engineering.
Maulana Abul Kalam Azad University of Technology, West Bengal (MAKAUT). **GPA:** *8.10/10.*

Research

Ph.D. Thesis

1. **S. Chatterjee**, "Designing quantum learning algorithms for classical objects," Available at https://repository.iiitd.edu.in/xmlui/handle/123456789/1758, PhD thesis, IIIT-Delhi, May 2025.

Conference Proceedings

1. **S. Chatterjee**, M. Mukherjee, and A. Sethi, "Generalization bounds for dependent data using online-to-batch conversion," in *Proceedings of the 28th International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2025. URL: https://proceedings.mlr.press/v258/chatterjee25b.html.
2. **S. Chatterjee**, T. SAPV, and D. Bera, "Efficient quantum agnostic improper learning of decision trees," in *Proceedings of the 27th International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2024. URL: https://proceedings.mlr.press/v238/chatterjee24a.html.

Journal Articles

1. **S. Chatterjee**, R. Bhatia, P. S. Chani, and D. Bera, "Quantum boosting using domain-partitioning hypotheses," *Quantum Machine Intelligence*, vol. 5, no. 2, pp. 1–20, 2023. DOI: 10.1007/S42484-023-00122-3.

Under Review

1. **S. Chatterjee**, "The quantum learning menagerie (quantum learning for classical concepts)," 2026.
2. M. Mukherjee, **S. Chatterjee**, and A. Sethi, "Perfect secret key generation for a class of hypergraphical sources," 2026. arXiv: 2601.10697. URL: https://arxiv.org/abs/2601.10697.
3. Y. Saxena, T. Sapv, **S. Chatterjee**, and R.-K. Lee, "Generalized cross-resonance scheme for maximally-entangling two-qutrit gates," 2026. arXiv: 2504.15265. URL: https://arxiv.org/abs/2504.15265.

Workshop Papers and Posters

1. **S. Chatterjee** and V. Kungurtsev, *Quantum solutions to the privacy vs. utility tradeoff*, 2023. arXiv: 2307.03118.

2 **S. Chatterjee**, R. Bhatia, P. S. Chani, and D. Bera, *Quantum boosting using domain-partitioning hypotheses*, Short Talk at the 6th Quantum Techniques in Machine Learning (QTML 2023). Poster presented at the 25th International conference on Quantum Information Processing (QIP 2022)., 2022. arXiv: 2110.12793.

3 **S. Chatterjee** and D. Bera, *Applying the quantum alternating operator ansatz to the graph matching problem*, Extended Abstract at the The 20th Asian Quantum Information Science (AQIS) Conference, 2020. arXiv: 2011.11918.

Teaching

Instructor (Short Courses)

Feb 2024 — Designed and taught 3 lectures at the **Chennai Mathematical Institute**.
Topic 1: The Harrow-Hassidim-Lloyd Algorithm and its extensions.
Topic 2: Block Encoding and Linear Combination of Unitaries.

Aug 2022 — Designed and taught 3 lectures for a refresher module at **IIIT-Delhi**.
Topic: C programming for Operating Systems.

Teaching Assistantship (IIITD)

Theory of Computation	Winter 2020, Winter 2021, Winter 2024. **[Head TA]**
Data Structures	Summer 2022. **[Head TA]**
Intro to Quantum Computing	Winter 2023. **[Sole TA]**
Modern Algorithm Design	Monsoon 2020, Monsoon 2021. **[Sole TA]**

My duties included designing and conducting tutorials, creating assignments, and holding office hours and remedial sessions for all the above courses.

Research Visits and Internships

Aug 24– Sep 24 — **ACMU, Indian Statistical Institute**, Kolkata.
Host: Prof. Sourav Chakraborty.

Jul 23– Aug 23 — **Czech Technical University**, Prague.
Host: Prof. Jakub Marecek, Prof. Vyacheslav Kungurtsev.

Feb 17 – Apr 17 — **Systems Engineering Intern**, Infosys Limited.

Jun 16– Jul 16 — **Data-Science Intern**, AlCircle Pte Ltd.

Invited Talks

Oct 2025 — STCS seminar, TIFR Mumbai.
Generalization bounds for dependent data using online-to-batch conversion.

May 2025 — CS Colloquium, Ashoka University.
Efficient quantum agnostic improper learning of decision trees.

Mar 2025 — Quantum Computing Workshop by Edunautic, IIT Delhi.
Full day workshop from fundamentals to hands-on instruction.

Jan 2025 — Young Scientists Session at QAC 2025 symposium, C-DAC and DIAT Pune.
Modern Algorithmic Primitives in Quantum Computing.

Oct 2024 — ACMU seminar, ISI Kolkata.
Generalization bounds for dependent data using online-to-batch conversion.

July 2024 — Recent Trends in Algorithms Workshop 2024.
Efficient quantum agnostic improper learning of decision trees.

June 2024 — ACMU seminar, ISI Kolkata.
Efficient quantum agnostic improper learning of decision trees.

Invited Talks (continued)

Februrary 2024	Quantum Computing Semester, Chennai Mathematical Institute. *Quantum Algorithms for Linear Algebra.* *Block Encodings and Linear Combination of Unitaries.*
September 2023	Center for Quantum Computing Science, University of Latvia. *Efficient quantum agnostic improper learning of decision trees.*
	IDA Seminar, Czech Technical University. *Efficient quantum agnostic improper learning of decision trees.* *Quantum boosting using domain-partitioning hypotheses.*
March 2022	Theory Seminar, Indian Institute of Information Technology Delhi. *Quantum boosting using domain-partitioning hypotheses.*
December 2020	Faculty Development Programme, JNTU Anantapur. *Quantum Machine Learning.*

Miscellaneous

Awards and Achievements

Aug 24	**IIITD Dean's List** for Best Teaching Assistant (Theory of Computation).
Apr 24	AISTATS 2024 Registration Grant.
Jan 22	QIP 2022 Student Travel Award (Not availed due to COVID restrictions).
Feb 20	**Runners Up, IBMQ Awards** - Teach Me Quantum 2019.
Oct 19	Full Scholarship to attend the 4th Winter School in CSE organized by the IIAS, HUJI, Jerusalem.

Reviewing

Conference	**STACS** ('25); **ICML** ('25,'26); **NeurIPS** ('24, '25); **ICLR** ('25,'26); **AISTATS** ('25,'26).
Journal	**Scientific Reports** ('24); **Quantum** ('24, '25).

Mentoring

Jan 24 – May 25	Alhad Sethi. B.Tech student at IIIT-Delhi.
Jan 24 – Jan 25	Neeshu Rathi. Ph.D. student at IIT-Roorkee.
Jan 21 – Jul 23	Parmeet Singh Chani. B.Tech student at DTU, Delhi.
	Rohan Bhatia. B.Tech student at DTU, Delhi.

Organisation

Workshops	Co-organised (only student organiser) and Webadmin for the QISE workshop at FSTTCS 2021.
Seminars organized	Talks on Quantum Computing at IIIT-D.
	Spectral Graph Theory at IIIT-D.
	Theory Reading Group talks at IIIT-D.
	Ketchup talks at IIIT-D.

References

Available on Request