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.

Education

2019 – Present **Ph.D.** in Computer Science and Engineering.
Indraprastha Institute of Information Technology, Delhi (IIIT-Delhi).
Advisor: Prof. Debajyoti Bera.
Thesis title: *Designing Quantum Learning Algorithms for Classical Objects.* (Submitted)

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

Research Visits

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

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

Research Publications

Journal Articles

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

Conference Proceedings

1. **S. Chatterjee**, T. SAPV, and D. Bera, "Efficient quantum agnostic improper learning of decision trees," in *International Conference on Artificial Intelligence and Statistics (AISTATS), 2-4 May 2024, Palau de Congressos, Valencia, Spain*, S. Dasgupta, S. Mandt, and Y. Li, Eds., ser. Proceedings of Machine Learning Research, vol. 238, PMLR, 2024, pp. 514–522. 🔗 URL: https://proceedings.mlr.press/v238/chatterjee24a.html.

Manuscripts and Short Papers

1. **S. Chatterjee**, M. Mukherjee, and A. Sethi, *Generalization bounds for dependent data using online-to-batch conversion*, Under submission, 2024. 🔗 DOI: 10.48550/ARXIV.2405.13666. arXiv: 2405.13666.

2. **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. 🔗 URL: https://arxiv.org/abs/2011.11918.

Invited and Contributed Talks

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.*
Februrary 2024	🔖	Quantum Computing Semester, Chennai Mathematical Institute. *Quantum Algorithms for Linear Algebra.* *Block Encodings and Linear Combination of Unitaries.*
September 2023	🔖	University of Latvia. *Efficient quantum agnostic improper learning of decision trees.*
	🔖	IDA Seminar, Czech Technical University. *Efficient quantum agnostic improper learning of decision trees.*
November 2022	🔖	The 6th Quantum Techniques in Machine Learning (QTML 2023) conference. *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.*

Teaching

Instructor

Advanced Quantum Algorithms, Feb 24	🔖	Took 3 lectures at the Quantum Computing Semester, **Chennai Mathematical Institute**. Topics included Quantum algorithms for linear algebra, Block Encodings.
Systems Refresher Module, Aug 22	🔖	Took 3 lectures for undergraduate and master's students at IIIT-Delhi. Topics included C programming and Operating systems.

Teaching Assistantship

Theory of Computation	🔖	Winter 2020, Winter 2021, Winter 2024.
Modern Algorithm Design	🔖	Monsoon 2020, Monsoon 2021.
Introduction to Quantum Computing	🔖	Winter 2023.
Data Structures and Algorithms	🔖	Summer 2022.

Miscellaneous

Awards and Achievements

Aug 24	🔖	**IIITD Dean's List** for Best Teaching Assistant (Theory of Computation).
Feb 20	🔖	**Runners Up, IBMQ Awards** - Teach Me Quantum 2019.

Reviewing

Conference[1]	🔖	NeurIPS'24, ICLR'25*, AISTATS'25*, ICML'25*.

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[1] * indicates invited reviewer.

Miscellaneous (continued)

Journal	Scientific Reports (2024), Quantum (2024).

Mentoring

Jan 24 – Present	Neeshu Rathi, Ph.D. student at IIT- Roorkee.

Organisation

Workshops	Co-organised the QISE workshop at FSTTCS 2021.
Seminars	Talks on Quantum Computing at IIIT-D.
	Ketchup talks at IIIT-D.
	Theory Reading Group talks at IIIT-D.

Research and Travel Grants

Apr 24	AISTATS 2024 Registration Grant.

Industry Experience

Sep 17 – Mar 19	**Staff Consultant,** Oracle Financial Services Software Limited.
Feb 17 – Apr 17	**Systems Engineering Intern**, Infosys Limited.
Jun 16– Jul 16	**Data-Science Intern**, AlCircle Pte Ltd.

References

Available on Request