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)

2003 – 2006
B.Tech. in Computer Science and Engineering.
Maulana Abul Kalam Azad University of Technology, West Bengal (MAKAUT).
GPA: *8.10*.

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**, S. Tharrmashastha, 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*.

[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