Dhruva Sambrani

Curriculum Vitae

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Educational Qualifications

BS-MS | 2018-2023 | IISER Mohali

CPI: 9.01 (4 Years)

Relavant Elective Courses | 2018-2023 | IISER Mohali

- Quantum Computing and Quantum Information
- Random Processes
- Non Linear Dynamics
- Modelling Complex Systems
- Network Science
- Machine Learning and Data Science

Academic Endeavours and Conferences

QICF-22 | YITP-Kyoto | 2022-(Future)

Weeklong workshop with talks on Quantum Information, Computation and Communication. (Future)

QUANT22 | MPI-PKS Dresden | 2022-(Ongoing)

Four-day school for master students providing an introduction to the fast-moving field of quantum matter, focusing on many-body systems ranging from exotic states of matter to quantum computers

Qiskit Global Summer School | Qiskit | 2022

Participated and completed the QGSS-22 which focussed on Quantum and Classical algorithms to simulate chemical systems.
QGSS Certificate. Credly Certificate

QICF-20 | YITP-Kyoto | 2020

Weeklong workshop with talks on Quantum Information, Computation and Communication.

Vijyoshi Camp | 2017

Attended the Vijyoshi camp in December 2017 against KVPY SA

KVPY | IISc | 2016-18

Qualified KVPY SA(2016), SX(2017), SB(2018) with a rank of 600, 1118 and 24 respectively and hold a KVPY Fellowship.

Research and Work Experience - Discovering the World

Quantum Intern | BQP | Summer 2022-Present

Interning at BosonQ Psi in the Quantum team where I proposed and built methods to solve problems of interest as part of a multiskilled team. Projects I was involved in were related to Feynman-Kac equation, Quantum Monte Carlo methods and Complexity analysis.

Superpositioned Grover's Algorithm | MN Bera | Summer 2022

In a similar vein to Quantum Resetting, this is an ongoing project to speed up the Grover's Search problem by applying a superposition of the Oracle and the Unitary.

Quantum Resetting of Quantum Systems | MN Bera | Summer 2021-Present

An ongoing project building on multiple works on Stochastic Resetting of Classical Systems and on Quantum Systems, and extending Anubhav Srivastava's Master's Thesis, we apply a superposition of the evolve and the reset mechanisms and explore the resulting dynamics of the system. We hope to speed up Quantum Walks [ISBN:978-3-319-97812-3], speeding up related algorithms which depend on Quantum Walks.

RLNN for Quantum Multiple Hypothesis Testing | Sarah Brandsen | Summer 2020

Studied RLNN is used for Quantum Multiple Hypothesis Testing. Project involved learning about RLNN and I helped optimize certain parts of the code for the suggested algorithm.

Ordering Channels | Sarah Brandsen | Winter 2020

An attempt to partial ordering of quantum channels by concepts of Data Driven Inferences. We define an order over the set of positive, trace preserving maps on the existence of another map which when applied would lead to equivalence. Based on Buschemi et. al. and Dall'Arno et. al.

Introduction to Quantum Mechanics and Computing | Arvind | Summer 2019

Studied Mathematical Structures that underlie Quantum Mechanics and a theoretical introduction to QCQI. Also attempted to simulate a Quantum Computer on a Classical computer and making a Julia module for the same. Report also serves as documentation of the code in the form while publishing.

Relativistic Black Body Radiation | JS Bagla | Winter 2018

I studied Black body radiation in special relativistic frames under JS Bagla, IISER Mohali, where I looked at how Black Body Radiation transforms in a frame that is moving uniformly with respect to the source. The quantitative analysis of the force due to non uniform radiation is done using numerical methods in Julia.

Programming - Reinventing The World

Modelling Complex Systems | Julia | 2021

As part of a course, I have learnt multiple models often used in the field and explored quite a bit in the following repository

QuantumComputing.jl | Julia | Package

An attempt to simulate a Quantum Computer and making a Julia module for the same. The associated paper also acts as the documentation

Coursera Courses | Python | Coursera

Completed the course Simulation and modeling of natural processes offered by Geneva University. Received Certificate with a grade of 95.31%
Completed the Specialization Introduction to Discrete Mathematics for Computer Science offered by National Research University Higher School of Economics & University of California San Diego. See Certification

PlutoReport.jl | Pluto | Package

A Julia package to make better reports and talks in Pluto Notebooks, especially with citation support, presentation mode with controls and timing, and planned integration with bibliography managers.

Github Profile | Multiple Languages | Others

Do visit my GitHub profile to see my other projects in a multitude of languages and fields!