

SAMARTH KASHYAP

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EDUCATION

Indiana University Bloomington

Doctoral Student
Department of Chemistry

Ongoing

Indian Institute of Science

Master of Science(Research)
Department of Physics

August 2022 - April 2023

CGPA : 8.8/10

Indian Institute of Science

Bachelor of Science(Research)
Department of Physics

August 2018 - April 2022

CGPA : 8.2/10

PAPERS AND CONFERENCE PRESENTATIONS

Quantum Convolutional Neural Network Architecture for Multi-Class Classification

International Joint Conference on Neural Networks

June 2023

- Presented the first Quantum CNN architecture capable of high-accuracy multiclass image classification
- Developed novel encoding scheme for quantum CNNs to mimic the advantages of a classical convolution

Advances in Machine Learning: Where Can Quantum Techniques Help?

ArXiv preprint

2025

- Examined the potential and pitfalls of modern QML approaches

RESEARCH EXPERIENCE

Center for High Energy Physics

Research associate with Prof. Apoorva Patel

IISc, Bangalore, India

October 2023 - July 2025

- Studying applications of VQEs to estimate hydrogen bond dissociation energies
- Developing simulation tools to assist in developing quantum algorithms

Department of Electronic Systems Engineering

Master's thesis under Prof. Shayan Srinivasa Garani

IISc, Bangalore, India

September 2021 - July 2023

- Studied the application of a quantum analogue of a convolutional neural network to classify classical data
- Proposed a novel encoding scheme to minimize information loss across quantum convolutional layers
- Proposed a new quantum convolutional neural network architecture with improved performance on classical data comparable to classical CNNs
- Ongoing work on extending the QCNN to quantum problems to take full advantage of the architecture

Department of Electrical Communication Engineering

Undegraduate research with Prof. Vinod Sharma

IISc, Bangalore, India

February 2021 - August 2021

- Studied applications of quantum machine learning in estimating information entropy.

Department of Instrumentation and Applied Physics

Thin films lab led by Prof. KR Gunasekhar

IISc, Bangalore, India

May 2019-July 2019

- Employed various vapor deposition methods to make thin film electronics.
- Analysed the I-V characteristics of the obtained devices and compared them with their 3-D counterparts.
- Studied the effect of an external magnetic field on sputter deposition.

TEACHING

Quantum Information Theory

Department of Electronic Systems Engineering, IISc, Bangalore

Teaching Assistant

August 2022 - December 2022

- Assisted Prof. Shayan Srinivasa Garani in teaching the course, grading and preparing problem sets and solutions.

SCHOLASTIC ACHIEVEMENTS

Kishore Vaigyanik Protsahan Yojana(KVPY) Fellowship

Department of Science and Technology, Government of India

August 2018-April 2023

- Awarded for obtaining rank 212 in the KVPY exam in 2016.
- Funded by the Department of Science and Technology for undergraduate research in India.

National Science Camp - Vijyoshi

Department of Science and Technology

December 2017

- Organized by the Department of Science and Technology.
- Attended interactive lectures presented by professors from various universities worldwide, on modern research areas and techniques at the Indian Institute of Science, Bangalore.

SKILLS

Programming skills: C, Python(with extensive experience in writing parallelized code), Matlab, LaTeX

Languages: English, Kannada

Other activities: Soccer, Running, Hiking

Positions of responsibility: Head of Corporate Relations, Pravega 2020(IISc undergraduate festival - Saw footfall of over 10,000 people)