

# SAMARTH KASHYAP

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## EDUCATION

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### 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

## CONFERENCE PRESENTATIONS

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### *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

## RESEARCH EXPERIENCE

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### Center for High Energy Physics

*Research associate with Prof. Apoorva Patel*

IISc, Bangalore, India

*Ongoing*

- 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

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### **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

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### **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

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**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)