



Abhay Saxena

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RESEARCH INTERESTS

Topological Matters, *Ab-initio* methods and Computational Physics, Quantum Computation, Machine learning, Hard Condensed Matter

EDUCATION

Degree	Institute	Board	CGPA/Percentage	Year
BS-MS	Indian Institute of Science Education and Research, Kolkata	-	7.8 (Till 6th Sem)	2021-26
Senior Secondary	Navyug Convent School Delhi	CBSE	92%	2021
Matriculation	Cambridge School Noida	CBSE	96.2%	2019

PROJECTS

- **Study of Topological insulators and DFT** June 2024 - Present
Supervisor/Mentor: Dr. Kuntal Roy (EECS Department, IISER Bhopal)
 - Demonstrated deep understanding through rigorous discussions with Professor Roy, for study of topological materials, emphasizing on Hall effects, SSH, Kane-Mele model, Majorana Fermion and graphene properties. Used *Kwant* for analyzing graphene nanoribbons and Quantum ESPRESSO for *ab-initio* calculations of topological insulators.
- **Quantum Computing - Quantum Algorithms in Qiskit** May - Jul 2023
Supervisor: Dr. Kuntal Roy (EECS Department, IISER Bhopal) [GitHub](#) • [Presentation](#) • [Report](#)
 - Title: Efficiency Comparison and implementation of VQE, VQD and p-VQD Algorithms in Qiskit
 - Studied in detail about various types of Eigensolvers, Time Evolver (p-VQD) Algorithms and other optimizer and amplifiers and customized implimentation of VQE, VQD and p-VQD in *ibmq_quito*.
- **Coding Project in Django, Nextjs and Javascript** May - Jul 2023
Supervisor: Dr. Dwaipayan Roy (CDS Department, IISER Kolkata) [Report](#) • [Certificate](#)
 - Title: Exploring and Implementing a Robust Crediting Module in Canteen Management System
 - Integrating Cashfree and MobiKwik payment gateway system in Students mess credit system using Python and Javascript

TECHNICAL SKILLS

- **Profocient Programming Languages:** Python, C, MATLAB, Kotlin, Javascript
- **Scripting Languages:** html/css/js, L^AT_EX, Numpy/Scipy/Matplotlib, React/NextJs
- **Tools and Frameworks:** Quantum Espresso, Qiskit, Git, Tensorflow, flutter, Android Studio, Arduino, Blender, Django

RELEVANT COURSES

Advanced Quantum Mechanics ([term paper](#)), Computational Physics, Linear Algebra I, Programming and Data Structures II, Nuclear Physics Laboratory, Mathematical Methods of Physics, Electrical Circuits and Electronics

STUDENT INTERESTS

- **Academic**
 - Completed Machine learning Foundational Crash Course by Google AI
 - Implemented Fundamental Quantum support vector machines using kernel tricks in Qiskit
 - **2023:** Volunteered Regular Classroom Teaching for summer vacation at [ek pehel](#)
- **Coding:**
 - **2023:** Completely coded and designed my Personal Website ([link](#)) from scratch
 - **2022:** Kotlin Based YouTube client on android that allows modification to website functionality and background action using GeckoView ([GitHub](#))
 - **2016:** Exercise App for spaced repeated timers and statistics, based on Cordova and updated to Webview([GitHub](#))
 - Arduino Projects: Nokia 5110 display, HC-05 and esp8266 based iot experiments
 - Attended IIT Delhi Rendezvous IOT Workshop for esp WiFi Module
- **Music:**
 - Intermediate Guitar and Piano player
 - Music and covers on LMMS audio workstation([Link](#))

ACHIEVEMENTS

- **Programming and Data Structures Course Group Project** : C Library System - Outstanding Group Assignment Honourable Mention Certificate: Prof. Kripabandhu Ghosh, CDS IISER Kolkata (Nov 2023) - [Certificate](#)
- Qualified JEE Advanced 2022 - top 2%
- Zonal topper for SOF National Cyber Olympiad Class 9, international rank 57 Class 7