

Alapan Chaudhuri

UNDERGRADUATE RESEARCHER, [CQST](#) & [CSTAR](#), IIITH

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EDUCATION	International Institute of Information Technology, Hyderabad <i>B.Tech. (with Honours) in Computer Science and Engineering (8.81/10)</i> <i>July 2019 - Present</i> Teaching Assistant: Automata Theory (Monsoon 2021)
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RESEARCH EXPERIENCE	Characterizing Absolute Classes of Quantum States <i>Centre of Quantum Science and Technology, IIITH</i> <i>Dec 2021 - Present</i> Working with Prof Indranil Chakrabarty on devising algorithmic approaches like convex optimisation to characterize absolutely separable quantum states. Furthermore, studying several other absolute classes like absolutely Bell-CHSH local states and ACVENN to find similar characterization criteria. Photonics for Quantum Communication <i>Centre of Quantum Science and Technology, IIITH</i> <i>Jan 2022 - Present</i> Studying fully deployable QKD systems using quantum photonic chips and working towards implementing various secure quantum communication systems using photonic integrated circuits. Quantum Private Information Retrieval <i>Signal Processing and Communication Research Center, IIITH</i> <i>May 2021 - Present</i> Working on QPIR capacity and protocols under different scenarios like replicated, colluding and/or coded servers with Prof Prasad Krishnan .
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EXPERIENCE	Incoming Compiler Development Intern <i>Qualcomm</i> <i>May 2022 - June 2022</i> Data Visualisation Intern <i>Trivedi Centre for Political Data</i> <i>Dec 2020 - Jan 2021</i>
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AWARDS	<ul style="list-style-type: none">• Ranked 9th in ICPC Asia Regionals 2020-21 (Gwalior-Pune)• Nominated for the 2022 ICPC Training Camp powered by Huawei• Ranked 1st (world) in Open Cup XXII-10 (Div 2)• Winner of the Goldman Sachs challenge at the Texas A&M Datathon• Sports Programming: highest rating of 2022 (5 star) on Codechef• Certificate of Merit (top 1%) for the 2019 Indian Olympiad Qualifier in Physics• Top 2% (national) in Google HashCode 2022
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POSITIONS OF RESPONSIBILITY	Student Moderator at NQSTS 2021 <i>National Quantum Science and Technology Symposium</i> <i>July 2021 - Aug 2021</i> Club Coordinator <i>Theory Group, IIITH</i> <i>Sep 2020 - Oct 2021</i> Moderator <i>Programming Club, IIITH</i> <i>May 2020 - June 2021</i>
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PROJECTS & OPEN SOURCE

Cirq

Google QuantumAI ([cirq](#))

Aug 2021 - Present

- Working on implementing support for OpenQASM3 in Cirq (ongoing).
- Implemented rotation gate and serial concatenation of Kraus Operators (with Zeeshan Ahmed).

Nostradamus: Weathering Worth

Nostradamus

Apr 2021

- Explored correlations between the stock market - its volatility and behavior - against weather conditions, environmental factors, and natural disasters.
- **Technologies Used:** Python, Yahoo Finance API

Canswer Mobile App

Caregrades Technologies

Feb 2021 - Apr 2021

- Created a mobile app ([published in playstore](#)) for patient engagement and remote connected care along with a similar version designed for hospitals to connect them to patients directly.
- **Technologies Used:** JavaScript, Firebase, React JS, Python.

Christine

Christine

Oct 2020

- Discord-bot that moderates online harassment along with toxicity and depressive behavior.
- Used 1.6 million tweets for constructing a scale to measure depression from text messages.
- **Technologies Used:** Python, NLTK, Google Cloud, JavaScript, Perspective AI.

Games and Computational Complexity

Playing Games

Sep 2020 - Nov 2020

- Proved the video game 'CELESTE' is NP-complete (original work). Furthermore, presented a dissertation explaining computational complexity of different games. Here is the [preprint](#).

Dotabase

Dota2 Analyzer

Sep 2020

- Analyzer for professional matches in the popular game Dota 2. Implemented a fully functioning DBMS based on data scraped from OpenDota and built a suitable CLI using Python.
- **Technologies Used:** MySQL, Pymysql, Python.

Mariam: a Linux Shell

Mariam

Aug 2020 - Sep 2020

- Basic shell/terminal implemented from scratch in C using Linux system calls. Includes piping, redirection, signal handling as well as extensive error handling.
- **Technologies Used:** C, Linux, Operating Systems.

SKILLS

Primary Languages: C, C++, Python, L^AT_EX, Bash, x86, Haskell, Racket
Others: Cirq, Q#, Qiskit, Tensorflow, Tensorflow Quantum, PyTorch, PennyLane
Web: JavaScript, React, HTML/CSS, MySQL, MariaDB

INTERESTS

Quantum Computing, Algorithms and Optimisation, Programming Language Theory, Quantitative Finance