

# Alapan Chaudhuri

Undergraduate Researcher



banrovegrie.github.io



banrovegrie



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## EXPERIENCE

### QUNASYS | QUANTUM RESEARCH INTERN

Aug 2022 - Present | Tokyo, Japan

- Working on building a framework for quantum chemistry focused on efficient simulation of Hamiltonians using both hybrid heuristics (like effective grouping for Pauli strings) and standard Trotter methods (or qubitization).

### AYERS LAB, MCMASTER UNIVERSITY | COLLABORATOR

June 2022 - Present | Hamilton, Canada

- Working with Prof Paul Ayers and his group on optimization algorithms for solving the positive semi-definite Procrustes problem, and extending the Procrustes python library.

### CENTRE OF QUANTUM SCIENCE AND TECHNOLOGY | RESEARCH ASSISTANT

Dec 2021 - Present | Hyderabad, India

- **Adiabatic Quantum Computing:** Working with Prof Shantanav on algorithms to predict avoided crossings for quantum systems under adiabatic evolution.
- **Entanglement Detection:** Working with Prof Indranil on identifying the degree of entanglement within a given quantum state, using unsupervised learning.

### QUALCOMM | COMPILER ENGINEERING INTERN

May 2022 - June 2022 | Hyderabad, India

- Worked with the LLVM team at Qualcomm on improving the Hexagon target by transitioning from building its own decodetree to that provided by QEMU for creating instruction decoders.

## PROJECTS AND OPEN SOURCE

### CIRQ, GOOGLE QUANTUM AI | PYTHON, SCIENTIFIC PROGRAMMING (SCIPY AND NUMPY)

2021

- Implemented rotation gate, serial concatenation of Kraus Operators and minor structural updates (with Zeeshan Ahmed).

### NOSTRADAMUS | PYTHON, YAHOO FINANCE API

2021

- Explored correlations between the NYSE and NASDAQ, their volatility and behavior, against environmental factors, weather conditions and natural disasters.
- Closely studied 28 stocks across 5 major sectors and overall monitored the behavior of 10913 tickers.

### CANSWER, DCODE CARE | JAVASCRIPT, FIREBASE, REACT NATIVE, PYTHON

2021

- Worked with Dcode Care on a mobile application for patient engagement and remote connected care amongst people battling with cancer.
- Published in Google Play with 500+ downloads (as of Aug 2022).

### CHRISTINE | PYTHON, NLTK, GOOGLE CLOUD, PERSPECTIVE AI

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.

## EDUCATION

### IIIT HYDERABAD

B.TECH. AND M.S. IN COMPUTER SCIENCE AND ENGINEERING

July 2019 - Present | Hyd, IN

CSTAR and CQST

CGPA: 9.08 (in-major), 8.63 (overall)

## SKILLS

C/C++ • Python • Haskell • Racket

Cirq • Q# • Qiskit • PennyLane

TensorFlow • PyTorch

L<sup>A</sup>T<sub>E</sub>X • Bash • x86

JavaScript • React • HTML • MySQL • MariaDB • Git

## AWARDS

- GSOC 2022 contributor to Open Chemistry.
- **Ranked 9<sup>th</sup> in ICPC Asia Regionals 2020-21** (Gwalior-Pune).
- Nominated for the 2022 ICPC Training Camp powered by Huawei.
- **Winner of Quantum Chemistry Challenge** at QHack 2022 by Xanadu.
- **Winner of Goldman Sachs Challenge** at Texas A&M Datathon 2021.
- Rated 2022 (5 star) on Codechef.
- **Certificate of Merit** for the 2019 **Indian Olympiad Qualifier in Physics**.
- Perfect score at zonal round of the 2018 Indian Computing Olympiad.

## PAPERS

Games and Computational Complexity

2020 | arXiv:2012.07678