

Alapan Chaudhuri

Undergraduate Researcher



banrovegrie.github.io



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EXPERIENCE

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

FAST HAMILTONIAN SIMULATION | PYTHON, QISKIT

2022

- Implemented a framework that can simulate any general Hamiltonian for quantum computing systems using optimized trotter methods and Szegedy quantum walks.
- Working on devising hybrid techniques to further improve the current benchmarks.

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^AT_EX • Bash • x86

JavaScript • React • HTML • MySQL • MariaDB • Git

AWARDS

- GSOC 2022 contributor to Open Chemistry.
- **Ranked 9th 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