Alapan Chaudhuri

Undergraduate Research Student, IIITH

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Education

B.Tech. + M.S. (by Research) in Computer Science and Engg.

International Institute of Information Technology, Hyderabad

July 2019 – Present Hyderabad, India

CGPA: 8.93

Research Projects

Independent Study in Quantum Information Science

Jan 2021 – Ongoing

- Motivated towards understanding fundamental problems in quantum information processing (like distillability) and quantum computation.
- Studying implementation of generic quantum algorithms using Cirq and Q# (ranked 48 overall in a MS Q# Contest '20).

Games and Computational Complexity

Playing Games for Research Purposes

Sep 2020 – Nov 2020

- Proved the video game 'CELESTE' is NP-complete and also how under certain changes it could have been PSPACE-Complete.
- Presented a dissertation explaining how computing different versions of Nash Equilibrium is PPAD-complete.
- Wrote an introduction to Constraint Logic, as a part on 'Formalisms for Modelling Games', based on original work by Demaine et al.
- Preprint: arXiv:2012.07678

Worked on the Square Achievement Game Problem

May 2019 – June 2019

- Analysed the paper "Extremal binary matrices without constant 2-squares" by Bacher et. al.
- Implemented possible winning strategies in Python, C++.

Technical Projects

Christine

Oct 2020

`https://github.com/banrovegrie/Christine`

- Discord-bot that moderates sexual harassment along with toxicity and depressive behavior.
- Used 1.6 million tweets for scaling depression from 0 to 4.
- Built using Python, Google Cloud, Javascript.

Synopsys

Oct 2020

`https://github.com/Groverkss/Synopsys`

- Discord-bot that summaries conversations and records them for future use.
- Based on text-summarization algorithms, discord bot backend, hosting bot and webapp on Cloud, Firestore.

Technical Skills

- Primary: **C/C++**, **Python**
- More: x86, Bash, Haskell, **Cirq**, LaTeX, Q#
- OS: **Linux**, Windows, macOS
- Web: Javascript, React, Node.js
- Familiar: Java, HTML/CSS, MySQL

Links

`https://github.com/banrovegrie`

`https://banrovegrie.github.io`

Some Achievements

Hackathons

2020 – Ongoing

- *Overall Winner, Second best use of Google Cloud, Best use of Big Data* – Kent Hack Enough
- *Best Web Application* – Hack At Home

Competitive Programming

2019 – Ongoing

- Rated 1795 on Codeforces (link)
- Highest rating 1967 on Codechef

Hash Code

Google

Feb 2020

- Top 6% (National)

Certificate of Merit, National Olympiad in Physics

Indian Association of Physics Teachers

2019

- Merit Awardee

Qualified the Indian Computing Olympiads

Indian Association for Research in Computing Science

2018

- Perfect score at regionals

Dota2-Analyzer

Sep 2020

http://github.com/Groverkss/Dota2-Analyzer

- Analyzer for professional matches in popular game Dota 2.
- Implemented a fully functioning DBMS based on data scraped from OpenDota and built a suitable CLI using Python.

Mariam: a Linux Shell

Aug 2020 – Sep 2020

https://github.com/banrovegrie/Mariam

- Basic shell/terminal implemented from scratch in C.
- Included piping, redirection, signal handling as well as extensive error handling.

Improved xv6

Monsoon 2020

https://github.com/banrovegrie/xv6

- Added new system calls and schedulers (e.g., MLFQ) to the original MIT xv6.

Experience

Data Visualization Intern

Trivedi Center for Political Data

Dec 2020 – Ongoing

https://tcpd.ashoka.edu.in/

- Worked on the dataset of Indian Governors to produce visualizations focused to understand trends, outliers, and patterns in the data.
- Performed large scale web scraping and data cleaning in order to ensure correct standardized data.

Coordinator

Theory Group, IIITH

Sep 2020 – Ongoing

https://iiittheorygroup.github.io/About.html

- Responsible for several initiatives of the club including co-starting the club's youtube channel which features talks by research students and alumni.

Moderator

Programming Club, IIITH

May 2020 – Ongoing

- Co-created an online platform to promote problem solving during 2020 Pandemic.
- Organized seminars and sessions on algorithms and data structures for the student community.

✓ *Updated Jan 2021*

Interests

- Algorithm Design
- Machine Learning
- Quantum Computation
- Computational Mathematics
- Complexity Theory

Relevant Coursework

Algorithms and Theoretical CS

- Data Structures and Algorithms
- Algorithm Analysis and Design
- Modern Complexity Theory
- Quantum Information Science (MITx)

Artificial Intelligence and ML

- Deep Learning Specializaton (Andrew Ng)
- Advanced ML Specialization (NRU-HSE)

Applied and Pure Mathematics

- Real and Complex Analysis
- Linear Algebra
- Probability and Statistics
- Quantum Mechanics
- Mathematical Foundations of Systems Science (TIFR)

Architecture and Systems

- Computer Systems Organisation
- Operating Systems and Networking
- Software Systems
- Introduction to Databases

** course offered at IIITH if not mentioned otherwise*

Languages

English ●●●●●

Bengali ●●●●●

Hindi ●●●●○