Sudatta Hor

sudatta_hor@brown.edu www.linkedin.com/in/sudattahor github.com/SudattaHor sudattahor.github.io

EDUCATION

Brown University
Bachelor of Science: ScB-Mathematics-Computer Science and AB: Physics *2020 - 2024*

Recent Coursework
Robust Machine Learning ○ Mathematical Cryptography ○ Computer Systems (**C/C++**, OS, parallelization) ○ Quantum Mechanics ○ Deep Learning (**TensorFlow**) ○ Numerical Optimization ○ Algebraic Graph Theory

EXPERIENCE

CSCI 1515 *Jan 2023 - Present*
Teaching Assistant
- Assisting **50 students** in learning how to implement secure systems using fundamental cryptography.
- Assisting in course development by implementing and testing **4 coding projects** in **C/C++**.

Rubenstein Research Group *Jan 2023 - Present*
Researcher
- Conducting quantum computing research to find applications of quantum algorithms to machine learning.

Quantum Computing Independent Study *Sep 2022 - Dec 2022*
Researcher
- Established quantum computing fundamentals in a **15-week** study with weekly written and coding assignments in **Qiskit**. Working in a group of **10 students** under professor mentorship.
- Completed quantum machine learning research project. **15 minute presentation** and 10 page report to be reviewed by **50 students**.

Los Alamos National Laboratory *Jun 2022 - Aug 2022*
Researcher
- Completed computational physics research project in high explosives at a **10 week** computational physics workshop consisting of **20 students**.
- Documented results and algorithms in **400 page** collective final report.
- Presented poster and talk to **+100 attendees** at the Computational Physics Summer Workshop at LANL.

PROJECTS

Escaping saddle points in VQAs *Report*
Numerical experiments using **Pennylane**. Investigates the use of stochasticity to escape saddle points in *variational quantum algorithms* (VQAs). Provides evidence that additional stochasticity can escape saddle points, but may also lead to worse solutions.

Uncertainty in high explosive equations of state *Poster*
Physics informed machine learning in **Python** to determine optimal *equation of state* parameters and quantify uncertainty. Parallelization of hydrodynamics simulations on **7 nodes** on LANL high-performance computers.

Cryptography algorithms *GitHub*
A **5 month** collection of cryptography algorithms written in **Python** documenting **5 main topics** in mathematical cryptography: Diffie-Hellman, RSA, signatures, elliptic curves, and lattices.

Quantum Connect 4 *GitHub*
A **Python** game that uses **Qiskit** to use quantum bits to superimpose players' moves in Connect 4. Created in a **team of 3** at the IonQ + Microsoft Joint Challenge @ MIT iQuHACK 2022.

SKILLS

Python ○ C/C++ ○ MATLAB ○ Qiskit ○ Pennylane ○ TensorFlow ○ Bash ○ Slurm ○ Git