Saurabh Totey Résumé

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Experience

May 2022 - Present

Combes Theory Group
Undergraduate Research Assistant
- Am investigating the performance of random quantum codes for quantum error correction in bosonic/harmonic oscillator contexts
- Use Python to run numeric simulations of different quantum error correction schemes and benchmark them against random codes

January 2023 - May 2023

CU Classical Mechanics I Course (PHYS 2210)
Learning Assistant
- Help students work through course material at the course's help room
- Attend lectures and guide students through tutorials and clicker questions

August 2022 - December 2022

CU Theory of Computation Course (CSCI 3434)
Grader
- Graded more than 40 students' proofs-based assignments with feedback
- Helped manage course infrastructure and support with the instructor, teaching assistant, and course assistant

May 2022 - August 2022

Amazon Devices
Software Development Intern
- Wrote code to give Alexa devices that don't have screens an indication of the remaining duration of their active timers through their LEDs
- Gave a final demonstration and presentation of my working feature
- Owned the feature and managed requirements and documentation between multiple teams with wildly varying locations while working entirely remotely

August 2021 - May 2022

Autonomous Vehicle Systems Lab
Undergraduate Research Assistant
- Wrote toy Physics Informed Neural Networks (PINNs) in Python with Tensorflow for gravity modeling
- Wrote code to perform visualizations and other comparisons of PINNs against traditional Polyhedral models
- Presented a poster of my work as one of 25 students selected out of over 100 students chosen to present about their project

August 2021 - December 2021

CU Data Structures Course (CSCI 2270)
Learning Assistant
- Held office hours and helped students work through the course
- Attended recitations and helped students with the recitation material
- Aided about 30 to 40 students per week on average

May 2018 - August 2021

PhET Simulations
Software Developer
- Wrote JavaScript code to develop educational scientific simulations for use on web browsers
- Worked on simulation code and made changes to common code like refactors or fixing memory leaks
- Developed large portions of the Blackbody Spectrum, Curve Fitting, Number Line Integers, and Number Line Distance simulations

January 2020 - May 2020

MATH Independent Study
Undergraduate Research Assistant
- Worked with Dr. Tianyuan Xu and other students to write Python code for the SageMath ecosystem that determined whether a given word from a given Coxeter group is fully commutative or not

Personal Projects

Planetary Conquest
Rust, Wgpu, WGSL, Threading, Game Development
- An in-progress voxel game that I am developing in my free time
- Build scripts are used to stitch individual textures into a texture atlas
- World generation is dynamic and threaded so player can explore and the world will generate around them on-the-fly
- Vertices for GPU are culled if not in camera's frustum
- Utilizes mouse and keyboard tracking and game loop management
- World parameters like gravity are parameterized from other factors like desired jump height and jump distance

Movie Chooser
TypeScript, React, PostgreSQL, Next.js, Accessibility, CSS3
- A website that chooses movies when many people are watching movies together but have different movie preferences
- Website allows users to create a watch-list with movies; then, when choosing a movie, each user has an equal probability of their watch-list being chosen, and then a random movie from the watch-list is selected
- Users can control the relative probabilities for movies getting chosen from within their watch-list
- Users can rate watched movies and the website calculates fun statistics
- Website consumes the TMDB API for movie information and stores its own information in a local PostgreSQL database
- Website is mobile-first with reactivity to screen size
- Accessibility tags are used wherever possible and accessible design was a large part of the design philosophy for the website

Code Kata Snek
Kotlin, Spring Boot, API construction, JavaScript
- A programming game I made as Fairview High School's Code Club's President, where members were divided into teams and each team was given an API key with which to control their snek
- Teams wrote code to control their snek over the web API and beat other teams in a game similar to the popular snake game
- A front-end page displayed a live visual representation of the game

Leadership

May 2020 - May 2023

HackCU Organizer
- Work in a small team to plan and run the annual HackCU hackathon
- Develop the website and ensure that the website is accessible
- Plan and host workshops at events
- Conduct interviews for potential new HackCU members

Education

August 2019 - May 2023

University of Colorado, Boulder
Bachelor of Science in Engineering Physics and Computer Science
Minors in Math, Philosophy, and Quantum Engineering
GPA: 3.924
- President Joseph A. Sewall Esteemed Scholar Award
- Engineering Merit Scholarship
- Quantum Scholars Fellow
- Dean's List 7-time recipient

Interests

- Quantum Information
- Computational Computability and Complexity
- Cosmology