

# Haad Bhutta

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## EDUCATION

### University of British Columbia, BSc Mathematics

Receipient of the UBC Centennial Scholars Entrance Award, 2021

Vancouver, B.C.

Sept. 2021 – Sept. 2025

## TECHNICAL SKILLS

**Languages:** Python, R, MATLAB, Java, C++, HTML5, CSS, SQLite

**Frameworks:** Flask, JUnit, Bootstrap, Jinja

**Developer Tools:** GitHub, Git Bash, Linux/UNIX

**Libraries:** pandas, NumPy, Matplotlib, Seaborn, JSON, Librosa, threading, XGBoost, LightGBM, TensorFlow, PyTorch

**Misc.:** MS Word, MS Excel, MS PowerPoint

## EXPERIENCE

### K-12 Mathematics Tutor

May 2022 – Aug. 2022

Mathnasium

Vancouver, B.C.

- Tutored many students from young children to older high-school students
- Discussed how to make students more enthusiastic about math with other tutors in the facility
- Develop engaging problem sets with real-world scenarios for students to develop their interest in math
- Organized fun activities to attract more students to the facility and grow the clientele

### Discord Server Moderator

Sept. 2023 – Present

University of British Columbia

Vancouver, B.C.

- Created and currently moderating Discord servers for *MATH317: Vector Calculus*, *MATH302: Introduction to Probability* and *MATH360: Introduction to Mathematical Modelling* offered at UBC
- Organized and led study sessions, helped students with homework questions and tutored struggling students while maintaining a heavy course-load myself
- Explained obscure lecture concepts to multiple students at a time

### IB SL/HL Mathematics Tutor

Sept. 2019 – July. 2021

Britannia Secondary School

Vancouver, B.C.

- Tutored multiple students at once while catering to each student's individual needs
- Explained concepts relevant to the IB exam to ensure student success
- Improved students' grades through consistent tutoring sessions
- Developed better teaching methods alongside instructors

## PROJECTS

### hbhutta/quran-verse-recognition | Python, TensorFlow, PyTorch, Numpy, Matplotlib, Seaborn, Librosa

Sept. 2023

- Manually cleaned and collected almost **200,000 audio samples** of Quranic verses recitations via a CDN
- Created a data preprocessing pipeline for raw audio data by normalizing audio samples, converting these into mel-spectrograms and performing data augmentation on these spectrograms to enhance model accuracy
- Threaded IO-bound processes to reduce data collection time from **44 hours to 12 minutes**
- Wrote a convolutional neural network to classify audio spectrogram images, enabling Quran readers to recite any verse and have the model classify it into the correct chapter

### Prunify | C++, valgrind, gdb

June 2023

- Reduced memory consumption by using space-partitioning trees to store image data, which also facilitated image compression without loss of quality
- Decreased code runtime from **15 minutes to 8 seconds** by memoizing recursive algorithms
- Used gdb and valgrind to save hours of time in debugging and locating segmentation faults and memory leaks

### hbhutta/JavaGo | Java, JSON

June 2022

- Developed a data-persistent Java GUI for users to play the game of Go
- Implemented common design patterns to reduce code redundancy and efficiency
- Utilized GitHub for version control and kept a log of new features added over the project period

### hbhutta/quran-data-aggregator | Python, requests

May 2023

- Aggregated and cleaned data from an online Quran API to present on Kaggle as an educational dataset
- Enabled Kagglers to practice NLP and semantic analysis on the verses from the Holy Quran. The code can be found here.