

# Dhanvi Bharadwaj

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## Education & Honors

### University of Wisconsin-Madison

Bachelor of Science in Physics, Minor in Data Science

Sept. 2020 – May 2024

- **Cumulative GPA:** 3.93/4.00, Dean's List

- Hildale Research Fellowship for undergraduate research

Relevant Coursework: Machine Learning, Data Structures, Object-Oriented Programming, Statistics for Data Science, Linear Algebra, Data Visualization, Computational Physics

## Technical Skills

**Languages:** Python, SQL, R, C++, HTML, MATLAB

**Libraries:** Pandas, NumPy, Matplotlib, Scikit-learn, PyTorch, SciPy, Flask, dplyr, ggplot2

**Software:** Jupyter, Git, Linux, Power BI, Google Cloud (GCP), Excel, Photoshop

**Conferences & Hackathons:** QTML 2023 (Paper Submitted), unitaryHACK 2023 (Open-Source Contributions), MIT iQuHACK 2023, CQN Winter School 2023: Quantum Networks, IBM Qiskit Summer School 2022 (Quantum Excellence Certification)

## Professional Experience

### Quantum Machine Learning Intern

May 2023 – Present

*Oak Ridge National Laboratory*

Oak Ridge, TN

- Developed and implemented Quantum Machine Learning models using PennyLane and Qiskit frameworks, focusing on 2-6 qubits to assess predictive capabilities on highly multivariate and non-linear datasets
- Optimized fidelity and cross-entropy loss methods in models, to reduce loss function values by an average of 20%
- Utilized state-of-the-art techniques such as data re-uploading to solve limitations posed by the no-cloning theorem and enhance the performance of our quantum models by 30%
- Implemented and refined quantum circuit architectures such as SU(4) and IsingZZ coupling for multiclass classification tasks on imbalanced datasets

### Undergraduate Researcher

Sept. 2020 – Present

*UW-Madison Thevamaran Lab*

Madison, WI

- Utilized Python to implement computational techniques to correct strain-overshoot in viscoelastic relaxation experiments, to help improve the accuracy of dynamic moduli calculations
- Collaborated with researchers to execute data analysis using SciPy that identified an opportunity to reduce noise from resonance effect
- Presented results and insightful trends to researchers using Matplotlib/Power BI at weekly meetings

### Peer Mentor Tutor

Sept. 2022 – Present

*UW-Madison Physics Learning Center*

Madison, WI

- Led dynamic and engaging collaborative learning sessions for over 50 students in university physics I and II, fostering a supportive and interactive environment conducive to effective learning
- Actively contributed to the continuous improvement of the Physics Learning Center by collaborating with fellow tutors and instructors to develop new educational resources and refine teaching methods

## Projects

### NBA MVP Predictor

- Programmed a machine learning model using Python and R to accurately predict 84% of all NBA MVPs including the 2021-22 season award winner
- Implemented powerful regression frameworks including Random Forest, LightGBM, and XGBoost, and utilized mutual information-based feature selection to improve model accuracy by 25%

### Wisconsin Land Tracts Analysis

- Utilized Python to implement supervised machine learning techniques for predicting population in Wisconsin counties based on land features, with 95% accuracy
- Implemented a color-encoded map of different land features for each county in Wisconsin, incorporating rasterized data, shapefiles, and GeoDataFrames to construct detailed plots

## Leadership & Involvement

### Collegiate Quiz Bowl Competitor

September 2020 – Present

*Wisconsin Quiz Bowl*

- Led team to achieve top 5 ranking in North ACF Fall 2020 tournament among 25+ participating universities
- Increased student engagement by actively promoting the club's impact and opportunities during organization fairs, resulting in an increase in new member sign-ups