

# OMAR ABDEL HAQ

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## EDUCATION

### HARVARD UNIVERSITY, SCHOOL OF ENGINEERING & APPLIED SCIENCES

Cambridge, MA

S.M. in Computational Science & Engineering. GPA: 3.89.

05/2024

*Coursework in Statistical Inference, Machine Learning, Data Science, Parallel Computing, & Deep Learning.*

*Graduate Teaching Fellow for Applied Computation 209A & B: Introduction to Data Science, and Advanced Topics in Data Science.*

### HARVARD COLLEGE

Cambridge, MA

A.B. in Statistics in Data Science, Secondary in Economics. GPA: 3.97.

05/2024

*Coursework in Data Structures & Algorithms, Probability, Multivariable Calculus, Systems Programming, & Linear Algebra.*

*Teaching Fellow for Computer Science 7: Introduction to Computer Science with Python, Statistics 139: Introduction to Linear Models.*

## EXPERIENCE

### DATA SCIENCE INTERN

06/2023 – 08/2023

#### basys.ai

- Applied propensity score matching to evaluate the effectiveness of physical therapy on health outcomes, demonstrating its efficacy in reducing pain levels and hospital readmission.
- Employed categorical feature standardization, word-embeddings, and time series summary statistics extraction after extensive aggregation, cleaning, and imputation to prepare a dataset of over 40 predictors and 2 million patients.
- Utilized gradient boosting (XGBoost) to build a predictive model for physical therapy pre-approval, with a focus on enhancing recall during tuning to minimize missed chances for health improvement, resulting in potential savings of ~ \$3,500 per patient.

### QUANTITATIVE RESEARCHER

08/2022 – present

#### Harvard University Economics Department

- Quantified racial bias in a large urban police department dataset of 800,000+ reports by analyzing report use of adjectives and adverbs via sentiment analysis and a naive Bayes classifier model.
- Investigated whether block-group demographics are linked to policing outcomes by integrating datasets of 100,000+ 911 calls, census demographics, and call-outcomes, through correlation analysis.

### ADMINISTRATIVE CONSULTANT & TESTING COORDINATOR

08/2020 – 09/2021

#### Pioneers Baccalaureate School

- Implemented a reusable automated system to track target skills for 8 core subjects by cross referencing student performance data and graduation requirement compliance.
- Proposed newly accepted graduation requirement model for American-style high schools in Palestine, reducing number of required tests to graduate down to 5 while convincing the Ministry of Education of continued rigorous academic standards.

## PROJECTS

### Cup Champions | Python; Scikit-Learn, SciPy, NumPy, Pandas

- Used mixture of models, including decision trees, random forests, and logistic regression on scraped player, team level, and historical soccer data to create a stacked model to predict the winner of two teams playing a match. Used results to predict winning teams of the 2022 World Cup.

### Data Torch: A DS & ML Guidebook

- Developed an open-access guidebook covering foundational concepts, model construction and tuning, and application-based approaches, to create a well-rounded reference for those interested in the fields of machine learning and data science.

### Sound Sift | Python; Keras, TensorFlow

- Built an urban sound classification system using a Convolutional Neural Network (CNN) enriched with a wide & deep fully connected component; trained the model on a dataset spanning 10 sound categories, yielding an accuracy of 83%.

### Genetic Walkers | C++; OpenMP, MPI, Box2D

- Utilized genetic algorithms, and parallel and distributed computing (OpenMP & MPI) to identify optimal joint torque parameters for an agent learning how to walk; an alternative to RL algorithms.

## ACTIVITIES

### HARVARD UNICEF CLUB, Operations & Logistics Lead

09/2021 — 05/2023

- Organized and scheduled elements of the 2022 & 2023 Empowering Humanity Conferences including venue, application process and outreach, catering and accommodations for 200+ remote and in-person attendees.

### THE HARVARD CRIMSON, Senior Reporter

10/2020 — 01/2023

- Reported on the university's global presence, the international student experience at the university, and K-12 education topics in the light of COVID-19, while mentoring incoming reporters about their junior beats.

## SKILLS

**Technical:** Python, R, C/C++, HTML, CSS, JavaScript, and MySQL.

**Language:** Fluent in English, Arabic, and Russian.