

Hamza ElMokhtar Shili

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EDUCATION

Rice University, *Houston, TX*

May 2025

B.S. Computer Science & B.A. Economics; Minors in Data Science and Financial Modeling GPA: 3.80/4.00

Relevant Courses: Machine Learning, Database Systems, Optimizations, Probability and Statistics, Linear Algebra

SKILLS

Languages & Databases: Python (Expert), SQL (Proficient), Java, C++, PostgreSQL, MongoDB, Neo4j

ML & Statistics: PyTorch, Scikit-learn, TensorFlow, NumPy, Pandas, Matplotlib, Jupyter Notebook

Tools: Linux/Unix, Docker, Git, REST APIs, AWS and Azure (basic familiarity)

WORK EXPERIENCE

OptimaLab, **Rice University**, *Houston, TX*

Oct 2023 – Present

Research Assistant

- Developed a benchmarking algorithm for ICARUS, a transformative deep learning model, reducing GPU training time by 20% and enhancing efficiency in distributed learning scenarios
- Implemented this benchmarking method using **Python** and **NVIDIA CUDA**, leading to a 15% improvement in accuracy and more realistic training scenarios for ICARUS
- Curating a specialized dataset for testing ICARUS in a federated learning context, aiming to evaluate and enhance its performance in distributed network environments

Office of the Dean of Undergraduates, **Rice University**, *Houston, TX*

Jun 2023 – Oct 2023

Data Management Intern

- Automated end-of-year reporting by developing a **JavaScript App Script** to process a Spreadsheet of awards and scholarships, cutting manual processing time by 60% and enhancing reporting accuracy
- Designed and implemented an **ERD** for an expense tracking app using **Firestore**'s cloud db, managing data for 11 colleges and 100+ profiles, enhancing scalability and data retrieval efficiency by 35%
- Refined database queries by implementing indexing, query refactoring, and result caching, achieving a 25% improvement in transaction processing speed and data retrieval efficiency.

PROJECT EXPERIENCE

Owl Ice Cream Truck (PostgreSQL, MongoDB, Neo4j)

Oct 2023 – Nov 2023

- Conducted stakeholder interviews to design an ERD, enhancing data organization efficiency by 30%
- Analyzed trade-offs between consistency and scalability using PoCs in RDBMS, document, and graph dbs.
- Developed the database in PostgreSQL, optimizing key business queries such as sales and inventory tracking, which enhanced operational efficiency by 25%.
- Executed query tuning and optimization, resulting in 40% less execution time and 15% more performance.

Emotion Prediction from Audio Files (Python, Librosa, Scikit-learn, Tensorflow)

Apr 2023 – May 2023

- Trained SVM, and CNN models on a 10,000-sample Kaggle dataset for emotion detection
- Extracted MFCCs and chroma features from audio using **Librosa**, achieving an accuracy of 90%
- Employed k-fold cross-validation that led to a 5% boost in prediction accuracy over baseline models

LEADERSHIP EXPERIENCE

Oshman Engineering Design Kitchen, **Rice University**, *Houston, TX*

Electronics & Computer Lab Lead

Aug 2022 – Jan 2023

- Created Embedded Systems workshop, enhancing electronics proficiency for 150+ participants
- Navigated semiconductor shortage, designing a database to manage 50+ processors and 100+ electronics
- Collaborated with fellow leads to recruit and mentor 10+ new lab assistants

Other: COMP 382 (Advanced Algorithms & Data Structures) Teacher Assistant, President of Rice MENA Student Association, Head of Marketing at Rice Blockchain Club, International Orientation Advisor