

# 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 Computation and Modeling

GPA: 3.81/4.00

**Relevant Courses:** Object Oriented Program Design, Advanced Algorithms and Data Structures, Introduction to Machine Learning, Introduction to Computer Systems, Parallel Programming

## Skills

**Programming Languages:** Python, Java, C, SQL, HTML, CSS, JavaScript

**Frameworks & Libraries:** PyTorch, JUnit, unittest, NumPy, Pandas, Scikit-learn, Matplotlib

**Technical Skills:** linux/unix, GDB, CAD (SolidWorks), PCB design (Eagle), Soldering

**Languages:** Arabic (native), French (fluent), English (fluent), Spanish (intermediate)

## Work Experience

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

Electronics & Computer Lab Lead

August 2022 – Present

- Develop curriculum of Embedded Systems Prototyping workshop to include electronics and circuits, basic microcontroller programming using Arduino, and basic microcomputer programming using Raspberry Pi.
- Compile student feedback data illustrating 80% feel more comfortable using what they learned in their projects compared to 50% in the previous year.
- Compose database with MySQL to keep track of the 50 processors that the OEDK stores, collaborated with other lab assistants to refurbish 20 of them, and allowed students to use them during the semiconductors shortage.

Summer Experience in Engineering Design Intern (Software Engineering)

June 2022 – Aug 2022

- Engineered the SMART HELMET system to send soldiers 6 patterns of vibrational cues generated from the information collected by thermal cameras and vitals sensors.
- Designed a Python library that included threat detection features, wake-up calls, and cueing functions to control 8 Linear Resonant Actuators (LRAs) to buzz in a pattern and frequency unique to each functionality.
- Programmed a testing suite in Python to evaluate the code in real hardware using Python and conducted human-testing on 10 test subjects that increased the product's accuracy by 40%.
- Proposed a new revised formulation of the LRAs code representation including a linked-list data structure and a divide and conquer algorithm that improved the time and space efficiency of the system by 30%.

## Leadership Experience

**Rice Middle East & North Africa (MENA) Student Association, Houston, TX**

Vice President

September 2022 - May 2023

- Relaunch Rice's only student organization for MENA students by building a leadership team and publicizing to students.
- Coordinated 4 social and cultural events to foster a sense of community and belonging on campus and acquired \$500 in funding for future events.

**Rice Blockchain Club, Houston, TX**

Head of Marketing & Technology

August 2022 - May 2023

- Built the club's website using HTML, CSS, and React JS, and collaborated with team members to improve UX/UI design.
- Design marketing material using Canva, Photoshop, and Adobe Illustrator, and enacted a marketing strategy across social media that enhanced the club's visibility and events yield by 40%.

## Projects

### **FEAT - Feedback & Evaluation via Automated Tests**

- Developed an efficient data-driven automated tool using Java, JUnit, and Roaster to generate test cases for Python programs and offer evaluative and formative assessments to help students learn how to debug their code effectively.
- Reduced the workload of instructors by 30% through automating the grading and evaluation process, freeing up time for more personalized feedback and teaching.

### **Predicting House Sale Prices**

- Developed a predictive model using NumPy, and Scikit-learn to predict house prices in Houston based on a Kaggle database.
- Cleaned and preprocessed data using principal component analysis (PCA) to reduce dimensionality before implementing linear, ridge, and lasso regression, then evaluated their performance to determine a best fit of 93% to the data.

### **Interactive Vitals Monitor**

- Designed and advanced a vitals monitoring device using the pocket-beagle microcomputer, a BPM sensor, a Blood Oxygen sensor, and an interactive touchscreen that measures heart rate and blood oxygen levels and displays them on an LCD screen.
- Provided a cost-effective alternative to more expensive monitoring systems that achieved an accuracy rate of 90% when compared with Apple Watch sensors.