Hamza Ahmed Abushahla

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EDUCATION

American University of Sharjah
 Aug. 2024 – Present
*MSc. Machine Learning – **CGPA: 3.65/4.0***
 Sharjah, UAE

American University of Sharjah
 Sep. 2020 – July 2024
*BSc. Computer Engineering; Minor in Engineering Management – **CGPA: 3.41/4.0***
 Sharjah, UAE
Senior Design Project: *Cognitive Radio Spectrum Sensing & Allocation: A Low-Complexity Deep Learning Approach*

PUBLICATIONS

- **H. A. Abushahla**, R. Gharaibeh, L. Elmugamer, A. R. Sajun, and I. A. Zualkernan, "Real-Time Student Engagement Monitoring on Edge Devices: Deep Learning Meets Efficiency and Privacy." **Published: IEEE EDUCON 2025**.

- **H. A. Abushahla**, D. Varam, and M. I. AlHajri, "Cognitive Radio Spectrum Sensing on the Edge: A Quantization-Aware Deep Learning Approach." **Submitted: IEEE Communications Letters**.

- **H. A. Abushahla***, A. J. N. Panopio*, L. Al-Khairulla*, and M. I. AlHajri, "Different Strokes for Different Folks: Writer Identification for Historical Arabic Manuscripts." **Submitted: Expert Systems with Applications**.

  *Denotes joint first authorship.

RESEARCH EXPERIENCE

American University of Sharjah
 Aug. 2024 – Present
Graduate Research & Teaching Assistant – Advised by: Dr. Mohamed Alhajri
 Sharjah, UAE

- Researching quantized neural networks for efficient, privacy-preserving deployment on resource-constrained edge devices and microcontrollers.

- Supervising computer science and engineering lab sessions, guiding students through hands-on projects, and resolving technical issues to support practical learning.

- Grading assignments and exams, and providing detailed feedback to improve student understanding and academic performance.

American University of Sharjah
 June 2024 – Aug. 2024
Undergraduate Research Assistant – Advised by: Mr. Ali Reza Sajun
 Sharjah, UAE

- Developed and deployed TinyML models on embedded platforms including the Sony Spresense, enabling on-device inference for edge AI applications.

- Contributed to multiple Machine Learning research projects by implementing and testing Deep Learning models, including CNNs, for tasks like image recognition and sensor data analysis.

eBrain Lab, New York University Abu Dhabi
 May 2024 – Aug. 2024
Visiting Machine Learning Researcher – Advised by: Dr. Alberto Marchisio
 Abu Dhabi, UAE

- Worked with the TinyCL continual learning hardware accelerator, assisting in developing and validating optimizations, including approximate multipliers, and benchmarking for performance improvements.

- Implemented embedded continual learning algorithms for autonomous mobile robots, focusing on perception and vision using the TinyCL architecture.

PROFESSIONAL EXPERIENCE

Dolphin Energy Limited
 May 2023 – Aug. 2023
Automation and Industrial IT Intern
 Abu Dhabi, UAE

- Developed a comprehensive understanding of the Oil & Gas sector, including upstream and downstream operations.

- Gained hands-on experience with Supervisory Control and Data Acquisition (SCADA) and Industrial Control Systems (ICS), focusing on network device integration and maintenance procedures.

- Carried out preventive maintenance procedures on SCADA cabinets, remote Cisco switches, and ICS maintenance laptops, ensuring network reliability and system security.

HONORS AND AWARDS

- **UAE Presidential Scholarship** Recipient
- **Dean's List** Recipient, Spring 2022, Spring 2023, and Spring 2024
- **2nd Place**, AUS College of Engineering Senior Design Projects Competition
- Member of the **IEEE-Eta Kappa Nu International Honor Society**
- Named to the **Top 100** high school graduates list across the UAE for 2020

SKILLS

Programming:	C/C++, Python, Java, Swift, JavaScript, MATLAB, Verilog.
Tools:	Visual Studio Code, Eclipse, Xcode, Pandas, Numpy, TensorFlow, Keras, Git, LaTeX, Bash, Microsoft Office, Adobe Photoshop, Fusion 360.
Operating Systems:	Linux, Apple Ecosystem (iOS, MacOS, etc.), Windows, Android.
Soft Skills:	Analytical Reasoning, Critical Thinking, Problem Solving, Communication, Teamwork, Leadership, Research Writing.
Languages:	English (Fluent), Arabic (Native).

RESEARCH PROJECTS

A Deep Learning Approach to Arabic Handwriting Recognition [Code]   **Sep. 2024 – Dec. 2024**

Developed an end-to-end deep learning-based CNN-BiLSTM Handwritten Text Recognition (HTR) system for Arabic script using the KHATT Dataset, trained with CTC loss. Our approach effectively addresses the complexities of Arabic cursive handwriting using a segmentation-based model, and is enhanced with KenLM language modeling for post-processing, achieving acceptable Character Error Rate (CER) and Word Error Rate (WER).

A Low-Complexity Deep Learning Approach for Spectrum Sensing [Code]   **Sep. 2023 – May. 2024**

Researched and developed a low-complexity CNN-based algorithm using Keras and TensorFlow for spectrum sensing in cognitive radio systems, including WiFi and LTE signals. Applied quantization techniques to compress the model for efficient deployment. Implemented and tested the solution on hardware platforms including Raspberry Pi, Arduino, and sensor nodes with antennas.

RELEVANT COURSEWORK

Graduate
Machine Learning: Adv. Machine Learning - Generative Deep Learning - Data Mining - Adv. AI
Undergraduate
Major Electives: Intelligent Autonomous Robotics - AI - Computer Security - Modern Computer Organization
Mathematics: Calculus (I, II) - Linear Algebra - Probability & Statistics - Discrete Mathematics - Differential Equations
Computer Science & Engineering: Data Structures & Algorithms - Operating Systems - Computer Architecture - Microcontrollers - Embedded Systems - Circuits - Electronics - Advanced Digital Systems
Engineering Management: Management for Engineers - Engineering Project Management - Engineering Economy

EXTRACURRICULAR COURSES

- Data Manipulation with Python [Certificate]   May 2025
  Coursera (Optima)
- Machine Learning [Certificate]   Jan. 2025
  Coursera (Stanford University)
- Mathematics for Machine Learning and Data Science [Certificate]   Jan. 2025
  Coursera (DeepLearning.AI)
- Python for Data Analysis: Pandas & NumPy [Certificate]   Dec. 2023
  Coursera (Coursera Project Network)
- Python Functions, Files, and Dictionaries [Certificate]   Dec. 2023
  Coursera (University of Michigan)
- Python Data Structures [Certificate]   Dec. 2023
  Coursera (University of Michigan)