

FIRAS DARWISH

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EDUCATION

University of Oxford

Starting Oct. 2025

Statistics and Machine Learning (PhD)

Selected as 2025 UAE Rhodes Scholar

- Joint Program with Imperial College London
- Projects: Physics-Guided Foundation Models for Wearables, Uncertainty Quantification for LLM Interpretability

New York University Abu Dhabi

Sep 2021 - May 2025

Bachelor of Science in Computer Engineering

GPA: 4.000/4.000 - Summa Cum Laude

- NYU Tandon School of Engineering & NYU Stern School of Business Fall 2023
- NYU Shanghai January 2024
- NYU Tandon School of Engineering & NYU Courant Institute of Mathematical Sciences Spring 2024

INDUSTRY EXPERIENCE

Oxford Centre for Artificial Intelligence

Oxford, UK

Consultant

May 2025 – Present

- Teaching **3 executive programs** in artificial intelligence to government and business leaders across the world (UAE, Japan).
- Leading lectures on using Retrieval Augmented Generation, Multi-Agent Systems, Reinforcement Learning, CNNs in Python to solve different business use cases.
- Providing feedback and consulting on the design process of AI projects and capstones led by participating entities.

e& (Etisalat)

Abu Dhabi, UAE

AI and Data Intern

May 2024 – Aug 2024

- Lead on the **design of 2 AI use cases with UNDP** for sustainable development in the Arab World (climate resilience, service delivery) and identifying data, privacy, and security challenges.
- Defined methodology for monitoring AI impact and **instituted AI governance for 40,000 employees**.
- Developed a GenAI recommendation system on Smiles mobile app, **serving 1.6 million households in the UAE**.

WhiteBox HR

Abu Dhabi, UAE

Machine Learning Intern

May 2023 – Aug 2023

- Designed a fully automated unsupervised ML algorithm to parameterize worker well-being and performance using dimensionality reduction and clustering techniques.
- Fine-tuned an in-house generative AI chat bot as a **Natural Language Interface to DataBase (NLIDB)** used for automatically generating statistics and visualizations from tabular data.
- Deployed solutions are utilized by **30+ companies and over 2,000 employees** across the UAE and MENA region.
- Developed a human-centered framework for data and ML development aligned with government partner needs.

CONSULTING

Artificial Intelligence Program 2025 | UAE AI Office, University of Birmingham

- Teaching 80+ government officials as part of a specialised training program managed by the **National Program for Artificial Intelligence** in the UAE and facilitated by the University of Birmingham and Oxford Centre for Artificial Intelligence.
- Leading lectures on using Retrieval Augmented Generation, Multi-Agent Systems, Reinforcement Learning, CNNs in Python to solve different business use cases.
- Responsible for providing feedback to AI projects prepared by groups like **Emirates, e&, RTA, DEWA, Masdar, Dubai Airports**.

Chief Artificial Intelligence Officers Program 2025 | UAE AI Office

- Teaching 20+ Chief AI Officers (CAIOs) from the UAE government as part of a specialised training program managed by the **Ministry of State for Artificial Intelligence, Digital Economy and Remote Work Applications** and facilitated by the Oxford Centre for Artificial Intelligence.
- Collecting and distributing resources to guide CAIOs on major topics like Neural Networks, CNNs, Retrieval Augmented Generation, Multi-Agent Systems, Reinforcement Learning.
- Designed Activity to Support CAIOs with forming a RAG use case relevant to their government body.

RESEARCH EXPERIENCE

Center for Artificial Intelligence and Robotics (CAIR), NYUAD

Abu Dhabi, UAE

Research Assistant

Feb 2024 – June 2025

- **MedCAM Project:** Pretrained adaptation module for enriching CXR representations with EHR data using global and contrastive loss, and tested in downstream classification and OOD detection tasks.
- **HD-sEMG Electrode Dropping Project:** Investigated redundant muscle pair activity patterns in the forearm to motivate channel dropping and reduce the computational cost of hand gesture recognition task (utilized ablation studies and GradCAM on different 3D and 4D CNN architectures).
- **Uncertainty Quantification Project:** Conducted literature review with 300+ multimodality, healthcare, and review papers scanned on Covidence.
- Using **PyTorch** and **Lightning** to effectively conduct experiments, log results, and **schedule multi-GPU and multi-node runs on NYU's High Performance Computing system**.

Engineering Capstone Project

Abu Dhabi, UAE

Researcher

Aug 2024 – May 2025

- Designing intuitive and reliable **multi-modal prosthetic feedback controller** simulated in VR
- Fusing sEMG signals from MindRove armband with pose detection from camera to enhance prediction of user's grasp.
- **Pre-trained multi-kernel CNN** for gesture recognition and **fine-tuned** on new subjects with linear head.

Open-Source ML Tools

Abu Dhabi, UAE

Developer

June 2024 - July 2024

- Developed source code for use in machine learning research and projects that is made freely available to all for possible modification and redistribution (**accessed by over 200 GitHub users since release**).
- Published Python package for 3-dimensional convolutional layers using Kolmogorov-Arnold Networks (KANs)
- Published Python package with 4-dimensional implementations of MaxPool, DropBlock, and SpatialDropout.

PUBLICATIONS

- **Firas Darwish**, Dhiyaa Al Jorf, Eion Tyacke, Costanza Armanini, Farah E. Shamnout, S. Farokh Atashzar. **“Leveraging Agonistic-Antagonistic Coactivation in Single-Grid HDsEMG for Hand Gesture Recognition.”** Submitted for review.
- **Firas Darwish**, Dhiyaa Al Jorf, Eion Tyacke, Costanza Armanini, Farah E. Shamnout, S. Farokh Atashzar. **“Enhancing the Efficiency of Hand Gesture Classification by Harnessing Muscle Synergies.”** Accepted to IEEE EMBC 2025 (Poster Presentation).
- Leopoldo Lopez, Shaza Elsharief, Dhiyaa Al Jorf, **Firas Darwish**, Congbo Ma, Farah E. Shamout. **“Uncertainty Quantification for Machine Learning in Healthcare: A Survey.”** Accepted to CHIL 2025 (Poster Presentation).

SELECT PROJECTS

Autonomous Water Debris Collection Robot | *Mubadala Competition*

- Designed an object detection and tracking algorithm for a water waste collection robot by training object detection networks (YOLO) and monocular depth estimation networks trained on simulated scenes.

Autonomous Vision-Based Line-Following Robot | *Embedded Systems Project*

- Built an autonomous robot algorithm using OpenCV and deployed on NVIDIA JetBot, featuring vision-based line tracking, intersection handling via HSV segmentation, obstacle detection, and dynamic navigation with bang-bang steering control.

Fall Detecting Watch | *Software Engineering Project*

- Wrote C++ scripts and deployed on M5 using accelerometer and gyroscope data to perceive when device suffers a fall and alert an emergency number via API call.
- Trained ML model to translate wearer's voice to commands to control watch.

Real-Time Drawing and Guessing Game | *Software Engineering Project*

- Built a Flask-SocketIO web application designed for real-time communication and interaction through a drawing and guessing game.
- Players can join rooms, participate in drawing, guess drawings made by others, and see real-time updates.

- Built using Python (Flask, Pipenv, PyTest), Docker, HTML, CSS, Javascript.

GoogleMeets Transcription Agent | *ML Agents Project*

- Developed an agent that automatically joins GoogleMeets calls, tracks the meeting's discussion, summarizes crucial points, and answers questions directly in the chat.
- Built using Python (Flask, Pipenv, PyTest), Selenium for web scraping, Tkinter for application development, and powered by Gemini.

COMPETITIONS

- **1st Place, eBrain Lab Generative AI Competition** - Fine-tuned foundation model to reduce model size and maximize performance on medical question-answer task.
- **2nd Place, Mubadala Water Debris Robot Competition** — awarded **\$8,200** for autonomous vehicle design.
- **3rd place in UAE, IEEEExtreme 17.0 Competition** - 24-hour global competitive programming challenge.
- **Audience Award, NYUAD Hackathon 2023** - Designed FuQdan, a quantum computing algorithm that acts as a binary dementia classifier for MRI scan images.

AWARDS AND HONORS

- **Rhodes Scholarship**, A Partnership between the Rhodes Trust and the Salama Bint Hamdan Al Nahyan Foundation - selected as 2025 UAE Rhodes Scholar and provided full-ride graduate scholarship to Oxford University.
- **Summa Cum Laude**, NYU Abu Dhabi — awarded to **top 5%** of graduating students in Engineering.
- **NYUAD Post-Graduation Practical Training Funding** — awarded **\$3,200** to work on AI for Clinical Decision-Making.
- **NYUAD Research Funding** — awarded **\$4,000** to work on faculty-supervised research (Summer 2023 & Summer 2024).
- **Founders Day Honors Scholar**, NYU — awarded to top-ranking baccalaureate candidates for academic excellence and scholarly distinction.
- **UAE Golden Visa for Outstanding Students** — granted for ranking among UAE's national academic toppers.

TALKS AND KEYNOTES

- **Keynote Speaker**, Abu Dhabi Ideas Summit 2025 - invited to speak to executives across energy companies on the UAE's untapped natural advantages in the digital and climate economy.
- **Forum Moderator**, China-Gulf Forum 2022 - invited to moderate discussion on infrastructure across UAE and China.
- **Interview**, *Khaleej Times*, *Al Etihad* - interviewed about views on AI developments and governance in the UAE as well as the Rhodes Scholarship.
- **Speaker**, NYUAD "AI & Us" Event - gave opening remarks based on time in the AI Advisory Group.