Ahmad Obeid, PhD

ELECTRICAL AND COMPUTER ENGINEER

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Summary

I am an AI specialist working at the intersection of deep learning, optimization, and data-driven modeling across multiple modalities, including images, sequences, structured data, and data in the wild. I maintain several open-source repositories, and have hands-on experience leading, monitoring, and collaborating on AI projects.

Projects

- Medical AI to combat insurance fraud, 2025-present
  - Patent pending
  - Raising funds
  - Developed a prototype and deployed it on cloud services using Docker.
- Efficient Deep Learning for Histopathology Medical Images, 2021-2025
  - Researched weakly-supervised, semi-supervised, transfer, and active learning, data augmentation and synthesis. Developed novel methods, and published multiple awarded academic works.
  - Developed an image synthesis technique and a novel pretext task to improve object detection accuracy by up to 9%.
  - Developed a topology analysis weakly-supervised learning framework to improve accuracy by up to 22%.
  - Developed an algorithmic approach to improve fine-grained accuracy by up to 2% in imbalanced settings
  - Developed a system to preserve the accuracy of a segmentation model while reducing annotation to 10% budget.
  - Maintained reproducibility practices using Git; published codes on Github.
- SauronAI, 2025
  - Developed a working prototype of a central AI monitoring and recommendation system, which communicates with six AI agents, each responsible for monitoring a specific safety and sustainability aspect in oil and gas off-shore plants.
  - Reduced response time to hazardous events, and improved monitoring efficiency.
  - Deployed Python code as a standalone website.
- Traveler Sentiment & Safety Monitoring, 2023
  - Developed a system for enhancing traveler experience at Dubai Airport using emotion and panic detection via CCTV, smartwatches, and phone data.
  - Reduced response time to hazards, and enhanced response protocol with LLM-based recommendation.
- EagleEye – AI for Emergency Response, 2022
  - Designed an AI-powered CCTV system to detect medical emergencies and hazardous incidents. Built a functional hazard detection prototype.
  - Reduced the emergency response time, and enabled a 24/7 accurate monitoring framework.
- Explainable Deep Learning for Genomic Engineering, 2020-2021
  - Developed a novel autoencoder that synthesizes thousands of viable gRNAs with high/mid/low efficiency, and used it to study the genomic characteristics of efficient sequences.
  - Synthesized 85000 gRNA sequences efficiently
  - Used statistical analysis to discover 5 high-efficiency sequence traits.
  - Published results in a top 2% journal.
- Imbalance-robust Deep Learning for Remote Sensing Data using UAVs, 2018-2020
  - Researched data-driven and algorithmic approaches to combat the problem of data scarcity in UAV images.
  - Developed a CUDA-based searching strategy to improve segmentation accuracy of remote satellite images by up to 23%
  - Maintained code versioning best-practices with Git; published code on Github.
  - Published results in a top 5% journal.
- Wireless Charging Transceiver System, 2017-2018
- Machine Learning and Deep Learning for Industrial Battery Monitoring, 2017-2018
  - Developed a supervised learning technique to monitor the discharge of factory batteries, and predict their downtime ahead of its occurrence.
- Power Amplifier for Radio Frequency, 2017
- Mini projects: Animals Recognition and Tracking; MATLAB numerical analysis package (non-linear solver, integration/differentiation, interpolation, ODE solver); Analysis of speech signals ...and more

Education

- **PhD** in Electrical Engineering and Computer Science, Khalifa University (KU), 3.88 2021 –2025

- **MSc** in Electrical and Computer Engineering, Khalifa University (KU), 3.93 2018 –2020
- **BSc** in Electrical Engineering, with **Minor** in Applied Mathematics, American University of Sharjah (AUS), 3.86 2014 –2018

Scientific Work

Summary: I am an active researcher with several publications.. I have a patent pending invention. I received multiple awards for my publications. I maintain high quality code online, presented several posters/talks, and was invited as a guest lecturer.

Highlighted work:

- **A. Obeid** and H. Almarzouqi, "CRISPR-VAE: An interpretable and efficiency-aware gRNA sequence generator," *Engineered Science*, 2025.
- **A. Obeid**, S. Javed, J. Dias, N. Werghi, A. Elfadel, "PMIL: A Topology Module to Improve MIL-based WSI Classification," in *Proc. IEEE Int. Symp. Circuits Syst. (ISCAS)*, 2025
- **A. Obeid**, T. Mahbub, S. Javed, J. Dias, and N. Werghi, "NucDETR: End-to-End Transformer for Nucleus Detection in Histopathology Images," in *Computational Mathematics Modeling in Cancer Analysis – 1st Int. Workshop (CMMCA)*, Singapore, Sep. 2022
- **A. Obeid**, I. M. Elfadel, and N. Werghi, "Unsupervised land-cover segmentation using accelerated balanced deep embedded clustering," *IEEE Geoscience Remote Sensing Letters*, vol. 19, pp. 1–5, 2021

Patents:

- Patent Pending:: AI-based Medical Insurance Fraud Guard

Online Code Repositories:

- github.com/AhmadObeid/PMIL: the official implementation of the PMIL and cPMIL modules
- github.com/AhmadObeid/NucDETR: the official implementation of the NucDETR model
- github.com/AhmadObeid/Balanced-DEC Keras and CUDA implementation for the GRSL paper
- github.com/AhmadObeid/CRISPR-VAE: the official implementation of CRISPR-VAE

Skills

Programming Skills

- Python (Pytorch, TensorFlow, JAX)
- MATLAB
- R (statistical modeling)
- SQL
- C/C++
- CUDA / OpenCL / OpenMP / MPI
- UNIX and Shell Scripting (workflow automation, job scheduling)
- RegEx
- Git (version control, collaborative development)

Technical Skills

- Deep Learning and Machine Learning (CNN/Transformer architecture, hyperparameter tuning, weakly-/self-/semi-supervised learning, explainable AI)
- Computer Vision (image Analysis, filtration, generative models)
- Natural Language Processing (data Mining, LLM Pretraining/Fine-tuning, multimodal learning)
- Sound Processing
- Applied Mathematics and Stochastic Processes (probabilistic modeling, inference techniques)
- Optimization Theory
- High-performance computing (distributed training, GPU clusters)
- Data Annotation, Preprocessing Pipelines, Visualization
- Model Deployment (cloud platforms, edge devices)
- DevOps & MLOps (Docker, model serving, reproducibility)

Experience

- Research and Teaching | Khalifa University, 2018-2025
- Research and Teaching | American University of Sharjah, 2017-2018
- Internship | Prime Engineering Co., 2017- 2017
    - Developed two smart systems: key-based gate system and smart curtains system, activated by sunlight.

Achievements

- Member of multiple Honor Societies
- Recipient of several academic awards
- Interviewed on National TV
- Won and participated in multiple hackathons