

ANAS AL-LAHHAM

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EDUCATION

Mohamed Bin Zayed University of Artificial Intelligence (MBZUAI)

Aug. 2021 - May 2023

MASTERS OF SCIENCE IN COMPUTER VISION (FULL RIDE SCHOLARSHIP)

UAE

- **GPA:** 3.68/4.0
- **Major courses:** Human and Computer Vision, Visual Object Recognition and Detection, Geometry for Computer Vision, Digital Twins.
- **Thesis:** "Pseudo-Label Generation and Refinement for Minimally Supervised Video Anomaly Detection"

King Saud University (KSU)

Sept. 2015 - May 2020

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING (FULL RIDE SCHOLARSHIP)

Saudi Arabia

- **GPA:** 4.79/5.0
- **Ranked 1st among students graduated in my major**
- **Thesis:** "Sky-Imager Based Forecast of Solar Irradiance Using Machine Learning"

PUBLICATIONS

- K. Abutalip*, **A. Al-lahham***, and A. E. Saddik, "Digital Twin of Atmospheric Environment: Sensory Data Fusion for High-Resolution PM2.5 Estimation and Action Policies Recommendation". *IEEE Access*, (2023).
- **A. Al-lahham**, O. Theeb, K. Elalem, T. Alshaw, and S. Alshebeili, "Sky imager-based forecast of solar irradiance using machine learning". *Electronics*, 9(10), (2020).
- "A Coarse-to-Fine Pseudo-Labeling (C2FPL) Framework for Unsupervised Video Anomaly Detection". *WACV* (Under Review).

RESEARCH INTERESTS

Computer Vision (Anomaly Detection), Signal and image processing, Renewable Energy.

PROJECTS

Anomaly detection using federated learning

Sep. 2023 - Present

- We propose a novel integration of Federated learning in video anomaly detection
- We exercise the concept of federated learning in our anomaly detection model to detect the anomalies where the data is attained from different clients

Minimally Supervised Video Anomaly Detection

Aug. 2022 - Present

- We propose a novel anomaly detection framework that is independent of the video length
- We propose a new technique for creating and refining feature-level pseudo-labels using weak supervision
- We extend the pseudo-labeling method to completely eradicate the need of having training labels (Under review)
- The proposed architecture is aimed to be transferable to different applications mainly **Automated Monitoring of Photovoltaic Plants**.

Automated Monitoring of Photovoltaic Plants using Aerial Videos

Dec. 2021 - Present

- The overall goal is to develop algorithms that enable automated monitoring or inspection of solar photovoltaic (PV) plants based on aerial videos captured using drones/unmanned aerial vehicles (UAV).
- The initial use case will focus on quantifying the amount of soiling deposited on the PV panels and estimate the corresponding PV power loss (PVPL).

Sensory Data Fusion for High-Resolution PM_{2.5} Estimation and Action Policies Recommendation*

Feb. 2022 - Sep. 2022

- The project aims to build a digital twin (DT) of an atmospheric environment by fusing remote sensing and observational data
- Estimated values of PM_{2.5} obtained from an ensemble model are used to provide recommendations for decreasing the agglomeration levels.
- Published an academic journal paper regarding the proposed project (**Published: 12 January 2023**).

Sky-Imager Based Forecast of Solar Irradiance Using Machine Learning

Sept. 2019 - Oct. 2020

- This project presents a new computationally efficient machine learning algorithms for forecasting the solar irradiance for durations from 1 hour up to 4 hours using sky images.
- Compared to state-of-the-art computationally heavy algorithms, our approach achieves competitive results with much less computational complexity for both nowcasting and forecasting up to 4 hours ahead of time.
- Published an academic journal paper regarding the proposed approach (**Published: 16 October 2020**).

EXPERIENCE

MBZUAI

RESEARCH ASSISTANT

Jul. 2023 - Present

UAE

Projects: 1) Automated Monitoring of Photovoltaic Plants using Aerial Videos 2) Minimally Supervised Video Anomaly Detection

MBZUAI

TEACHING ASSISTANT FOR MATHEMATICAL FOUNDATIONS OF ARTIFICIAL INTELLIGENCE

Aug. 2022 - Dec 2022

UAE

YOUSSEF MARROUN CONT.CO (YMCO)

ELECTRICAL PROJECT ENGINEER

Jun. 2019 - Aug. 2019

Saudi Arabia

- **Internship** at YMCO on DALLAH hospital west expansion project. Worked with the electrical engineering team on reviewing and verifying different electrical systems layouts using AutoCAD, such as power, lighting, structure cable.

TECHNICAL STRENGTHS

Software & Tools MATLAB, AutoCAD
Languages Python (Intermediate), C++ (Basic)
Frameworks PyTorch, OPENCV, Tensorflow

ACADEMIC ACHIEVEMENTS

***Top 3 Teams in NASA Airathon competition: Predict Air Quality**

2022

King Saud University Distinguished and Talented Students Program Student Member

2015