

Education

National Graduate School of Arts and Crafts

Industrial Engineering degree: Artificial Intelligence and Data Science

Meknes, Morocco

Sept 2022 - Current

National Graduate School of Arts and Crafts

Preparatory classes

Meknes, Morocco

Sep 2018 - Jun 2020

L'Ange Bleu

High school degree in Mathematics and basic Engineering science

El Jadida, Morocco

Sep 2015 - Jun 2018

Artificial Intelligence Portfolio

Embodying a qubit's mind using Stochastic Deep Reinforcement Learning and Quantum Computing

Meknes, Morocco

National Graduate School of Arts and Crafts

Nov 2022 - July 2023

- Mathematical framework for studying qubits: Studying Hilbert space, the density matrix, Bell states and reversibility on quantum entanglement
- Describing the Reinforcement Learning model: Q-learning method, exploration and exploitation, deciding on a policy, Visualizing the agent using a graphical interface.
- Collecting real data from IBM Quantum Lab and building the Quantum circuit on IBM Lab using Qiskit
- Predicting next spin and introducing a classification model

Time Complexity Optimization for Branch and Bound Algorithm using Machine Learning

Meknes, Morocco

National Graduate School of Arts and Crafts

May 2023 - June 2023

- Background on Travelling salesman problem and its solutions using Brute Force and Branch and Bound algorithms.
- Calculating Time complexity of Branch and Bound algorithm in TSP problem.
- Execution of K-means clustering on the scattered data.
- Comparing the results of both models: Clustering and Branch and Bound and displaying the new optimized time complexity.

Optimizing the Q-learning method on Atari games

Meknes, Morocco

National Graduate School of Arts and Crafts

April 2023 - July 2023

- Optimizing reinforcement learning algorithms based on the Q-learning method for Atari games: Pong, Breakout...
- Introducing a target network and a learning rate scheduling.
- Comparing the results to the existing DQN and DDQN algorithms.

Designing a Sun Tracking Model for an Intelligent Energy Cell

Meknes, Morocco

National Graduate School of Arts and Crafts Meknes - UQAR Canada

Sept 2023 - Feb 2024

- Modeling the environment of the energy cell by creating a custom gym environment.
- Using Reinforcement Learning to get a maximum of solar energy with different policies.

Workforce Planning: Developing Smart AI-driven Schedule Optimizers

Meknes, Morocco

National Graduate School of Arts and Crafts

Oct 2023 - Dec 2024

- Proposing a study case with a customized scheduling problem.
- Generate artificial data and work on heuristic and Machine Learning algorithms: Genetic algorithms, Hungarian algorithms, LPP, SVM.
- Developing a Streamlit app displaying smart schedules and statistical analysis of productivity and fatigue.

Smart Electronic Voting using Blockchain and Big Data

Meknes, Morocco

National Graduate School of Arts and Crafts

Nov 2023 - June 2024

- Generate elections data and store it off-chain using IPFS.
- Design a Smart Contract on Sandbox environment: Tenderly using Solidity and JavaScript for votes count.
- Validating votes on blocks network on Ethereum.
- Data Analysis of validated votes with Apache Spark and Map-Reduce.

Internships

Predictive Maintenance using Recurrent Neural Network

El Jadida, Morocco

Nestle Factory

July 2022 - Aug 2022

- Building the LSTM RNN structure and analysing data through 5 steps: Identifying sensors, data collection, data plotting, data smoothing, correlation and dimensionality reduction.
- Computing the network model and evaluating its performance.
- Studying Bachman-Landau notation: Big O complexity of space and time.

Enhancing a Control Model utilizing Online Analysis for Quality Improvement in the Manufacturing of DAP Fertilizer

El Jadida, Morocco

OCP Group - DAP/JFC4

Aug 2023 - Sept 2023

- Applying Six Sigma Methodology to enhance the control system.
- Providing corrective recommendations to the operator, in the case of anomalies, using logical frameworks.
- Creating real-time dashboards in Power BI with push datasets from SQL SMS.
- Creating an interactive GUI using Flask and embedded Power BI report.

Deep-RL for Collaborative Target Acquisition and Coverage Optimization Applied to a Satellite Constellation

Rabat, Morocco

Ai Movement - UM6P

Feb 2024 - July 2024

- State of the art on Satellites and semi-cooperative settings.
- Inducing cooperation in a semi-cooperative prey-predator game.
- Introducing a new Reputation Mechanism and new Filtered Reward Shaping Functions.
- Comparing our algorithm to baselines: IQL, Partial Q-MIX, and PED-DQN.

Personal Projects

Teaching Quantum Agents to stay Entangled inside a Wormhole

March 2023 - April 2023

- Background on Completeness of Quantum mechanics and EPR=ER conjecture: Einstein Rosen bridges, EPR on quantum entanglement, studying entanglement of qubits on opposite sides of a wormhole.
- Study of flow of information in the event horizon: Hawking radiation, Quantum hair theory, no-cloning and no-broadcasting theorems.
- Displaying the density matrix of entangled particles falling into a black hole
- Quantum reinforcement Learning: proposing a RL model based on QOMDP and a simulation of the experiment on a holographic wormhole.

Twin and Cousin Primes in the Forming of all Even Numbers

Sept 2022 - Nov 2022

- Mathematical Background on Goldbach's and Polignac's conjectures
- Proposing two new conjectures: Weak Goldbach and twin prime conjecture and Strong Goldbach and twin-cousin primes conjecture.
- Displaying algorithm for checking the validity of the conjectures.
- Mathematical correlation between the conjectures.

Skills

Programming	Python, C#, SQL.
Artificial Intelligence	Machine learning, Deep learning, Transformers, Big Data.
Python frameworks	TensorFlow, PyTorch, Scikit-learn, Pandas, Numpy, Stable Baselines, Qiskit.
Miscellaneous	Microsoft Office, LATEX(Overleaf), Texmaker, FlexSim, Tableau, Power BI.
Soft Skills	Creativity, Emotional Intelligence, Time Management, Brainstorming, Problem-solving.

Languages

Arabic	Native proficiency
English	Professional proficiency
French	Professional proficiency