Youssef Amdouni

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OBJECTIVE

Join an innovative team in the field of artificial intelligence, leveraging my solid foundation in mathematics and computer science. Through courses such as machine learning, data mining, probability and statistics, I have built a robust academic background. Additionally, I have practical experience working with natural language processing (NLP) using large language models (LLMs), computer vision, and generative AI. I am enthusiastic about advancing my career within the realm of artificial intelligence, driven by my passion for applying my expertise and contributing meaningfully to this dynamic and evolving field.

LANGUAGE SKILLS

French and English

SKILLS

- **Programming language:** Python, C/C++, R, SQL, Git.
- **Operating systems:** Windows, Linux.
- **Python/R Libraries:** Python/R Libraries numpy, pandas, Bokeh, seaborn, sciket-learn, OpenCV, Tensorflow, Keras, Pytorch, nltk, Spacy, Gensim, Pyspark, sqlalchemy, pymongo, streamlit, sktime, statsmodels, ggplot2, dplyr, shiny.
- **IDE:** Jupyter notebook, Databricks, Jupyter Lab, VS-code, R studio, Docker, PowerBI.
- **Machine Learning:** ETL, Linear/Polynomial Regression, Logistic Regression, KNN, K-means, Principal Component Analysis, SVM, Ensemble Learning, Exponential Smoothing, ARIMA, Deep Learning (Fully connected neural network, CNN, RNN, YOLO), OCR.
- **Finance:** Portfolio Optimization (Markowitz, Capital Asset Pricing Model), Factor model, Trading option pricing (Black-Sholes).

WORK EXPERIENCE

Research Assistant **Oct 2023 - Present**
UQAM bioinformatics lab • Montréal
Development of an artificial intelligence model for predicting the likelihood of human embryo euploidy based on images from multiple imaging systems during IVF, combined with clinical data.
Keywords: Python, OpenCV, Pytorch, CNN, Transfer Learning, Hybrid Model, Timelapse.

Teaching Assistant **Sep 2023 - Dec 2023**
UQAM • Montréal
Assisting students during practical work, facilitating understanding and development of key skills for the INF5111 course Fundamentals for using business data science platforms.
Keywords: Python, PostgreSQL, UML, MongoDB, Interactive Visualization.

Data Scientist **Jan 2022 - Apr 2023**
CIENA • Montréal, Québec
Anomaly detection in Ciena's system logs
- Literature review on anomaly detection methods in system logs.
- Data collection, analysis, and preprocessing.
- Separation of system logs into a fixed part and parameters (variable part).
- Implementation of an approach based on deep learning and semantics for classification

Keywords: Anomaly Models, SQL, AWS, Databricks, Deep Learning, LSTM, Transformer, LLM, BERT, Regex.

Data Scientist **Oct 2020 - Dec 2021**
AXEFINANCE • Tunis, Tunisia
Digital onboarding
- Liveness detection by asking clients to validate a randomly given gesture.
- Document detection and classification (Tunisian CIN and passport).
- Face detection and verification.
- Content extraction through optical character recognition (OCR) and text processing to enhance OCR results.
- Models' deployment using flask and docker.

Participated in an AI platform project to help credit risk analysts read financial news (financial sentiment analysis, text synthesis, financial event detection).
Keywords: OCR, Deep Learning, YOLO, VGG Model, flask, Postman API, Docker, Haar cascade classifier, Image processing, data analysis, Bag of words, RNN, LSTM, Words embedding, LLM, BERT.

Data scientist (Graduation project) **Feb 2020 - Jun 2020**
QUANT-DEV • Tunis, Tunisia
Predictive Modeling for Intra-day Trading Volume in the Chinese Stock Market
- Decomposing the volume into market component and specific component using PCA.
- Predicting the market component using a moving average and linear regression to forecast the abnormal changes.
- Improving the market component forecast using different portfolios decomposition.
- Improving the specific component prediction using more sophisticated machine learning models.

Keywords: High-frequency trading, Turnover, PCA, Common Component, Specific Component, Linear Regression, Huber Regressor, RANSAC, Linear SVR, Stacking.

EDUCATION

Master of Computer Science (GPA 4.23/4.3) **Jan 2022 - Apr 2024**
Université de Québec à Montréal • Montréal
Courses: Machine Learning (INF7370), Foundations of Artificial Intelligence (INF8790), Association Rule Mining (INF7710), Concepts and Techniques in Data Mining and Exploration (INF8100), Methods of Artificial Intelligence in Bioinformatics (INF889E).
Research project: We present a novel self-supervised contrastive learning framework designed to learn representations at multiple levels of abstraction: node-, proximity-, cluster-, and graph-levels. Subsequently, we investigate the transition between these abstraction levels using geometric metrics.
Scholarship for Exemption from Additional Fees

Bachelor of Engineering, Economic and Scientific Management **Sep 2017 - Jun 2020**
École Polytechnique de Tunisie • Tunis, Tunisia
Multidisciplinary three-year courses : Applied Mathematics, Computer Science, Algorithms, Optimization, Machine Learning, Quantitative Finance, etc

Associate Degree **Sep 2015 - Jun 2017**
Institut Préparatoire aux Études d'ingénieurs de Tunis • Tunis, Tunisia
Two-year courses: Linear Algebra, Numerical Analysis, Computer Science, Physics, Chemistry, and Engineering Techniques.

CERTIFICATIONS

- Applied Data Science I: Scientific Computing & Python, WORLDQUANT University.
- Applied Data Science II: Machine Learning & Statistical Analysis, WORLDQUANT University.
- Certificate in Machine Learning, Coursera.
- Deep Learning Specialization by deeplearning.ai, Coursera.
- Applied Machine Learning in Python Specialization by Michigan University, Coursera.
- Stochastic Processes by the National Research University Higher School of Economics, Coursera.
- Advanced SQL certification from Hacker Rank.

PROJECTS

- **Portfolio Optimization:** Develop an application for analyzing stocks and constructing portfolios using methodologies like Markowitz and CAPM.
- **Housing Price Prediction:** Extract data from the Duproprio website and build a predictive model for housing prices in Quebec.
- **Image Classification:** Create a convolutional neural network capable of distinguishing between six animal species and a convolutional autoencoder for encoding and reconstructing images.
- **Sentiment Analysis:** Analyze sentiment in texts using probabilistic models (TF-IDF, Bayesian classifier), CNN, LSTM, and LLM.
- **Time Series Forecasting:** Develop a Shiny application to analyze and forecast energy consumption in Quebec using several models such as exponential moving average, ARIMA, linear regression, and LSTM.
- **Detection of Tunisian Vehicle License Plates and Information Extraction:** Use YOLO V3 for object detection and Tesseract for information extraction.