HOUSSEM EDDINE BAYOUDHA

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in Houssem-Bayoudha — **⌂ Houssem Eddine Bayoudha**

DATA SCIENTIST / MACHINE LEARNING ENGINEER

PROFESSIONAL SUMMARY

Machine Learning Engineer and Data Scientist with a strong background in deep learning, reinforcement learning, and data science. Experienced in developing and optimizing machine learning models across energy optimization, sports analytics, and computer vision domains. Proficient in PyTorch, TensorFlow, and advanced reinforcement learning algorithms. Passionate about solving complex challenges through data-driven solutions and innovative technologies.

WORK EXPERIENCE

Machine Learning Research Intern   Mar 2024 - Sep 2024 (Expected)
University of Passau   *Passau, Germany*

- **Project** : Optimization of Hybrid Energy Storage Systems (HESS) using reinforcement learning.
- **Achievements**:
  - Awarded the DAAD KOSPIE Tunisia Scholarship for academic excellence
  - Developed a novel reinforcement learning algorithm to optimize power distribution in HESS, integrating renewable energy sources like solar and wind.
  - Conducted extensive simulations and real-time experiments, enhancing energy efficiency by 5%.
- **Current Work**: Co-authoring a scientific paper based on the research findings.

Data Scientist   Jun 2023 - Oct 2023
Real Analytics   *Liverpool, England, United Kingdom · Remote*

- **Contributions**:
  - Implemented a TorchLightning data module for machine learning tasks, streamlining data handling and organization.
  - Applied the Soft Actor-Critic (SAC) algorithm in an online setting, enhancing data collection processes.
  - Developed and trained a Conservative Q-Learning SAC (CQL-SAC) policy model in offline settings, achieving performance parity with leading libraries like D3RLPy and CleanRL.

Machine Learning Engineer   Jul 2022 - Nov 2022
Magaztee   *Tunisia · Remote*

- **Responsibilities**:
  - Performed data cleaning and augmentation using Albumentations, increasing dataset quality and diversity.
  - Designed and optimized a Convolutional Neural Network (CNN) using PyTorch and ResNet architectures for image classification tasks.
  - Deployed the model into production for a major French telecommunications provider, improving classification accuracy by 21.25%.
  - Conducted rigorous testing and validation to ensure model robustness and scalability.

Data science Intern   Jun 2021 - Oct 2021
Real Analytics   *Liverpool, England, United Kingdom · Remote*

- **Projects**
  - Standardized soccer tracking data from multiple providers, creating a unified dataset for analysis.
  - Developed predictive models to determine player positions using generated heatmaps from match movements.
  - Utilized FastAI, R, MongoDB, and PyTorch to implement and refine models, increasing prediction accuracy by 15.52%.

EDUCATION

Master's Degree in Information Technology (Data Science Specialization)   Ariana, Tunisia
The Private Higher School of Engineering and Technology (ESPRIT)   *Sep 2019 - Aug 2024*

- **Notable Coursework** : Machine Learning, Deep Learning, Data Mining, Statistical Analysis, Big Data Technologies.
- **Honors** : Ranked among the top students in the program.

Baccalaureate in Computer Science   Fouchana, Tunisia
El Amal High School   *June 2019*

- **Achievement** : Ranked 9th nationwide in the national examinations.

SKILLS

Data Science: Pandas, NumPy, Matplotlib, Seaborn, Plotly, Scikit-learn, Gradient-Boosting Algorithms
Deep Learning: TensorFlow, PyTorch, Keras, CNNs, RNNs, GANs, Transformers, GNNs, TorchLightning
Reinforcement Learning: OpenAI Gym, DQN, SAC, CQL, Stable Baselines3
DevOps: Docker, Git, Jenkins, Grafana, Prometheus
Data Engineering: Spark, Hadoop, Hive
Databases: MySQL, MongoDB
Web Development: Django, Flask, HTML, CSS
Programming Languages: Python, R, JavaScript

PERSONAL PROJECTS

Risk Management Recommendation System :
    Context: Academic project at ESPRIT.
    Description: Developed a risk management system using Graph Neural Networks (GNNs) to analyze relationships within project management data from the PMBOK (Project Management Body of Knowledge)
    Outcome: Provided actionable insights and recommendations for risk mitigation, enhancing decision-making processes.

Interactive Math Learning Platform :
    Context: Academic project at ESPRIT.
    Description: Created an educational platform for teaching mathematics to children aged 6-12 through interactive scenarios.
    Features:

      - Math Problem Generator: Tailors problems to the user's skill level.
      - Answer Verification: Utilizes ChatGPT API for immediate feedback.
      - OCR Integration: Allows handwritten input recognition.
      - Voice Recognition: Supports voice-based interaction.
      - Gamification Features: Enhances learning engagement through rewards and progress tracking.

    Impact: Improved user engagement and learning outcomes among target users.

Art Generation using GANs :
    Context: Personal project.
    Description: Developed a Generative Adversarial Network (GAN) model trained on hand-drawn art.
    Outcome: Generated new artwork in a similar style, demonstrating proficiency in GAN implementation and fine-tuning for image synthesis

LANGUAGES

English: Advanced speaking and writing (C1)
German: Basic knowledge (A1)
French: Decent French (B2)
Arabic: Native language

CERTIFICATES

Machine Learning Specialization :
    Machine Learning by Stanford University & DeepLearning.AI on Coursera

NVIDIA DLI Certificate – Building Transformer-Based Natural Language Processing Applications :
    NVIDIA Deep Learning Institute

NVIDIA DLI Certificate – Applications of AI for Anomaly Detection :
    NVIDIA Deep Learning Institute

Deep Reinforcement Learning :
    Certificate of Excellence | Completion of the Hugging Face Deep Reinforcement Learning Course

Generative A.I., from GANs to CLIP, with Python and Pytorch :
    Certificate of Completion | Udemy Certificate

Machine Learning in Production Specialization :
    Certificate of Completion | Introduction to Machine Learning in Production