Karim Nadim

Data Scientist

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PROFESSIONAL SUMMARY

Data Scientist with 4+ years of experience applying machine learning to solve real-world industrial and energy challenges. Skilled in developing end-to-end ML pipelines and deploying models in production with MLOps (Docker, MLflow, AWS). During my work at CanmetENERGY, I delivered measurable impact by reducing equipment downtime, energy consumption, and operational costs. Strong communicator with ability to collaborate across engineering and business teams.

WORK EXPERIENCE

Data Scientist | CanmetENERGY | Varennes, QC | Aug 2024 – Present

- Delivered an end-to-end ML pipeline with containerization (Docker) for forecasting industrial evaporator KPIs, improving predictive accuracy for operators. Executed CI/CD automation with Github Actions.
- Automated report summarization for engineers, cutting manual review time by 60% using NLP and LLMs (Hugging Face) with cloud deployment (FastAPI, AWS EC2).
- Deployed anomaly detection on industrial time-series data, enabling proactive maintenance and reducing equipment failures by 96% with deep learning Autoencoders.
- Built and deployed a Reinforcement Learning (RL) scheduling agent in TensorFlow, which reduced steam consumption in a paper mill by 10%, directly lowering operational costs for industrial clients.
- Built a recommendation system for process control that improved energy efficiency by 15% compared to baseline, driving measurable cost savings while aligning with business rules (PyTorch).
- Implemented ETL data pipelines for paper mill data using SQL and Pandas to enable ML pipeline readiness.

Data Science Research Assistant | CanmetENERGY | Varennes, QC | Jan 2020 – Apr 2024

- Reduced downtime and emissions for a concentrator equipment by 30% through a predictive maintenance model (LSTM, PyTorch).
- Delivered 98% accuracy in forecasting industrial system behavior with ensemble ML regression models (XGBoost, scikit-learn), improving business reliability of production planning.
- Performed exploratory data analysis, data visualization, and feature engineering on recovery boiler data, improving data interpretation and model accuracy.
- Optimized model hyperparameters with Optuna enhancing model accuracy by 7% and tracked experiments in MLflow ensuring reproducibility for management review.
- Applied dimensionality reduction (t-SNE, PCA) to connect process variables with economic outcomes.
- Partnered with engineers and business stakeholders to align ML solutions with operational and business goals.
- Presented findings to non-technical managers, supporting data-driven decisions and publishing results in peer-reviewed outlets.

EDUCATION

- **Doctorate in Industrial Engineering | Ecole Polytechnique de Montréal | Canada | Aug 2018 – Apr 2024**
- **Bachelor's in Mechatronics Engineering | German University in Cairo | Egypt | Jan 2012 – Jan 2017**

TECHNICAL SKILLS

- **Programming Languages**: Python, SQL, Bash/Shell
- **ML & DL Frameworks**: PyTorch, TensorFlow, Scikit-learn, XGBoost, Keras
- **MLOps & Tools**: MLflow, CI/CD, Git, Docker, Airflow, FastAPI, Heroku, AWS (SageMaker, ECR, EC2)
- **Data Analysis & Visualization**: Pandas, NumPy, Matplotlib, Seaborn, Statsmodels
- **NLP & Generative AI**: Hugging Face Transformers, GPT models (OpenAI API), BERT fine-tuning