Oscar HOUESSOU

Applied Mathematics & Modeling Engineer | Data Scientist | AI Researcher

Cotonou, Benin | oscarjohouessou@gmail.com | 🔗 LinkedIn | 🔗 GitHub

PROFILE

Applied Mathematics and Modeling Engineer specializing in developing artificial intelligence solutions for understanding and forecasting complex systems. My research focuses on hydrological modeling using **Recurrent Neural Networks (LSTM, GRU)**, resulting in two **peer-reviewed publications**. I am particularly interested in **model interpretability (XAI)**, a key challenge for responsible and explainable AI. With three years of experience as a Data Scientist at Gozem, I have designed and deployed large-scale machine learning models trained on real-world, imperfect data.

Seeking a Research Master's position at Mila to focus on robust and interpretable learning models, leveraging my experience in XAI and large-scale deployment.

RESEARCH INTERESTS

Deep Learning, Recurrent Neural Networks, Representation Learning, Generative AI, Explainable and Robust AI (XAI), Natural Language Processing, Computer Vision, Machine Learning for Climate Change, Optimization, Learning Theory.

PUBLICATIONS

BIAO, I. E., HOUESSOU, O., ZOHOU, P. J., & ALAMOU, A. E. (2024). *Comparison of Two Recurrent Neural Networks for Rainfall–Runoff Modeling in the Zou River Basin at Atchérigbé (Benin). Journal of Geoscience and Environment Protection, 12*(9), 119–137 (**Co-authored**).

🔗 https://doi.org/10.4236/gep.2024.129009

ZOHOU, P. J., BIAO, I. E., AOGA, J., HOUESSOU, O., ALAMOU, A. E., & EZIN, E. C. (2023). *Modeling River Discharge Using Deep Learning in the Ouémé Catchment at Savè Outlet (Benin, West Africa). SSRG International Journal of Geoinformatics and Geological Science, 10*(1), 29–35 (**Co-authored**).

🔗 https://doi.org/10.14445/23939206/IJGGS-V10I1P103

RESEARCH EXPERIENCE

Research Assistant (collaboration) – *Applied Hydrology Laboratory (LHA/UAC)* *May 2022. – Mar. 2023*

- Contributed to rainfall–runoff modeling studies using RNN architectures (LSTM, GRU).
- Developed **HyMoLap**, an interactive hydrometeorological simulation tool.
- Co-authored and reviewed scientific manuscripts accepted for publication.

Engineering Thesis Project – *Applied Hydrology Laboratory (LHA/UAC)* *Jun. – Dec. 2022*

- Designed streamflow forecasting models based on multi-source rainfall time series.
- Conducted data preparation, cleaning, and validation using hydrological performance indicators.

- Developed a prototype RNN-based discharge prediction model.

PROFESSIONAL EXPERIENCE

Data Scientist – Gozem Bénin

Mar. 2023 – Present

- Developed an **intelligent customer support chatbot** powered by RAG (Retrieval-Augmented Generation) and advanced **Natural Language Processing (NLP)** techniques, **improving first-contact resolution by 50%**.
- Built and deployed **computer vision models** used by **thousands of users**, ensuring:
  - Automated vehicle inspection from images.
  - Visual compliance verification of vehicle branding.
- Developed **credit-scoring** models to assess vehicle lease financing eligibility and predictive analytics tools to support financing operations.
- Implemented **Explainable AI (XAI) tools** to ensure model transparency and accountability in high-stakes operational contexts.
- Collaborated with cross-functional teams on data governance and quality at scale.

TECHNICAL SKILLS

Programming: Python, R, SQL, MATLAB

ML Frameworks: TensorFlow, PyTorch, Scikit-learn, MLflow, TFX

MLOps Tools: Git, GitLab CI/CD, Docker

Visualization: Tableau, Power BI, Looker Studio, Streamlit

EDUCATION

Engineering Degree – Applied Mathematics & Modeling

National School of Mathematical Engineering and Modeling (ENSGMM), Benin — *2020–2022*

Numerical modeling, optimization, advanced statistics, applied probability, and machine learning.

Scientific Preparatory Classes (Math–Physics)

National Institute of Preparatory Classes for Engineering Studies (INSPEI), Benin — *2018–2019*

HONORS & AWARDS

Excellence Scholarship, awarded following a competitive entrance examination to the Preparatory Classes for Engineering Studies (INSPEI), Benin, renewed for the Engineering cycle based on academic performance (2018–2022)

LANGUAGES

French – Native

English – Professional proficiency