Yuba Amoura, PhD

Experienced Quantitative Researcher and Investment Analyst with hands-on experience in **portfolio research**, **macroeconomic analysis**, and **factor-based investing**. Skilled in building tools and models that support data-driven investment decisions. Strong foundation in **statistics** and **data science** with practical expertise in **Python**, **SQL**, and **machine learning**.
Experienced in presenting complex technical concepts to technical and non-technical audiences including senior executives.

EXPERIENCE

Analyst, Investment Research — May 2024 – Current
Alberta Investment Management Corporation (AIMCo), Toronto, Canada

- Developed a factor investment strategy tool aligned with AIMCo's portfolio, supporting both client advisory and internal strategy decisions **(R, Matlab)**
- Designed and implemented a scalable database for efficient storage and retrieval of economic and financial data (**SQL, Python, Pandas, Databricks)**
- Automated the creation and updating of hundreds of macroeconomic charts, enhancing research workflows and communication (**Python, Streamlit, Plotly)**
- Built a recession risk indicator using macro and financial data with machine learning techniques to aid in forward-looking analysis.

Doctoral Researcher — May 2019 – Aug 2023
University of Waterloo, Waterloo, ON, Canada

- Pioneered a novel method to extract galaxy cluster age data from simulations, improving cosmological insights at no additional observational cost.
- Standardized and processed terabytes of simulation data from varied sources into a unified dataset for advanced statistical analysis **(Python, Numpy, SQL, Matplotlib, Pandas)**
- Generated and analyzed 25 large-scale universe simulations (100TB), establishing a data foundation for future research projects **(Cloud computing, Linux, Bash, C++)**

EDUCATION

Ph. D. in Astrophysics — May 2019 – Aug 2023
University of Waterloo, Waterloo, ON, Canada

Masters in Statistics-Modelling-ML — Sept 2018 – Mar 2019
Université Paris Descartes, Paris, France
Relevant coursework: Optimization, Stochastic Algorithms, Classification, High Dimension Learning, Poissonian Processes
Ranked first in the masters.

Masters History and Philosophy of Sciences — Sept 2016 – Jun 2018
Université Diderot-Paris 7, France

Masters in High Energy Physics — Sept 2014 – Aug 2016
Ecole Normale Supérieur de Cachan and UPMC Paris 6 , France

MACHINE LEARNING PROJECTS

- **Power Outage Prediction:** Built a predictive model using **severe weather data** to forecast power outages (Project link)
- **Windmill Detection (**Classification Competition): Achieved 91% accuracy in detecting windmills from satellite images using a superlearner model **(R, Python, OpenCV)**

CONTACT
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GitHub
Personal website

TECHNICAL SKILLS
Advanced Python: Numpy, Scipy, Matplotlib, Jupyter. LaTeX, Linux
Intermediate OpenCV, Scikit-learn, SQL, Pandas, Git/GitHub , Streamlit, Plotly
Familiar R, C/C++, Matlab, TensorFlow, PyTorch

SOFT SKILLS
Analytical Thinking – Solved complex problems in both astrophysics and finance using statistical modeling and machine learning.

Communication – Presented technical insights to executives, researchers, and students; developed tools and visualizations to support decision-making.

Collaboration – Worked across research and investment teams on high-impact, data-driven projects.

Adaptability – Transitioned from academic research to applied finance; led independent projects with minimal guidance.

Languages – Fluent in English, French, Berber and Arabic

OTHER
- Tutored 100+ students (high school and university) in Math, Physics, Statistics

PUBLICATIONS
Full list at google scholar

"Cluster Assembly Times as a Cosmological Test", **Y. Amoura et al**., Monthly

- **Image Size Reduction via K-means Clustering:** Reduced image color palettes with minimal quality loss using K-means clustering **(Python, Pycharm, OpenCV)**
- **Cancer Gene Prediction with PCA:** Applied **Principal Component Analysis (PCA)** to identify gene combinations most correlated with various cancer types (R).
- **Galaxy Cluster Analysis with PCA:** Used **PCA** on galaxy cluster data to explore structural properties and age correlations (GitHub)

Notices of the Royal Astronomical Society (2021)

"Halo Growth as a Cosmological Test", **Y. Amoura et al.**, MNRAS (2024)