

# Yuba Amoura, PhD

Experienced Quantitative Researcher and Investment Analyst. Proficient in **Python** programming, **data engineering and analysis**, **statistical analysis**, and **mathematical modelling**, with a strong foundation in data manipulation and simulation techniques. Uniquely able to bring **adaptability**, **resilience**, and a **global perspective** to any team.

## EXPERIENCE

### Analyst, Investment Research

May 2024 – Current

*Alberta Investment Management Corporation (AIMCo), Toronto, Canada*

- Designed and built a database for effective storage and access of economic and financial data (**SQL, Python, Pandas, Databricks**)
- Built tools to facilitate the creation and update of 100s of macro-economic charts in a chartbook app (**Python, streamlit, plotly**)
- Created a factor investment strategy tool adapted to AIMCo's portfolio helping inform client and internal team's decisions (**R, Matlab**)
- Created a recession indicator using macro and financial data and **Machine-Learning (Python)**

### Doctoral Researcher

May 2019 – Aug 2023

*University of Waterloo, Waterloo, ON, Canada*

- Led a project to design a new original method to use galaxy cluster data. Improves our Universe comprehension using existing data, at no extra cost.
- Acquired, cleaned and transformed raw simulation data (TBs) from various sources with different formats to a unique universal usable set of data about cluster ages (**Python, Numpy, SQL, Matplotlib, Pandas**)
- Predicted Universe properties using the cleaned data and regression methods
- Developed a set of 25 simulations of the Universe, generated 100TB of a unique data set which will be the basis for new projects over the next decade (**Cloud computing, Linux, Bash, C++**)

### Teaching Assistant

Sep 2019 – Dec 2022

*University of Waterloo, Waterloo, ON, Canada*

- Designed lesson materials, visuals and digital presentations to supplement lesson plans for 9 different courses.
- Consulted with and supported more than 100 students to solve technical and personal issues
- Collaborated with other TA's and instructors for the design and implementation of teaching material

## 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*

## CONTACT

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[Linkedin](#)

[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 reasoning** and **Problem solving** acquired through studying Physics and solving complex research problems

• **Communication** and **Collaboration** through teaching, presentations and collaborating on research projects

• **Quantitative skills, rigor** and **attention to detail** through studying math and physics, analyzing research papers, writing, reading and debugging codes

• **Innovation, Learning, Independence** and **Empirical research** through the design, development, and completion of novel projects in unexplored areas with little available information

## COMMUNICATION

Fluent in English, French, Berber and Arabic

## OTHER

- Tutored 100+ students (high school and university) in Math, Physics, Statistics
- Teaching chess to visually deficient students using original and innovative learning techniques adapted to the students

## MACHINE LEARNING PROJECTS

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- Power outage predictions: Developed a model that leverages severe weather data to predict power outages ([Project link](#))
- Classification competition: detecting windmills from satellite images. Used a superlearner with svm, random forest and glm. 91% accuracy obtained (**R**, **Python**, **OpenCV**)
- Clustering using K-means for image size reduction. Reducing number of colors with minimal impact on quality (**Python**, **Pycharm**, **OpenCV**)
- Principal Component Analysis (PCA) to predict which combination of genes are most correlated to different cancer types (**R**)
- PCA to on galaxy cluster structural properties and age ([GitHub](#))

## PUBLICATIONS

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Full list at [google scholar](#)

“Cluster Assembly Times as a Cosmological Test”, **Y. Amoura et al.**, Monthly Notices of the Royal Astronomical Society (2021)

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