Yuba Amoura, PhD

Researcher with a passion for unraveling complex problems. Expertise in **Python** programming, **statistical analysis**, and **data visualization**. Equipped with a strong foundation in data manipulation and **simulation** techniques. Eager to leverage my **problem-solving**, **analytical reasoning** and **communication** skills acquired during my PhD to drive impactful solutions to challenging problems.

EXPERIENCE

Doctoral Researcher
May 2019 – June 2023

University of Waterloo, Waterloo, ON, Canada GitHub repository

- Managed multiple research projects of varying lengths (weeks to years), including everything from design, development, testing and implementation.
- 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 **(Python, Scipy, Pandas, Matplotlib)**
- Led a project to design a new original method to use galaxy cluster data, results published in a peer-reviewed journal. Improves our Universe comprehension using existing data, at no extra cost.
- Developed a set of 25 simulations of the Universe, generated 100TB of a unique data set which will be used over the next decade to understand fundamentals of the formation of structures **(Cloud computing, Linux, Bash, C++)**

Teaching Assistant
Sept 2019 – Dec 2022

University of Waterloo, Waterloo, ON, Canada

- Designed lesson materials, visuals and digital presentations to supplement lesson plans
- Assisted in maintaining engaging and respectful educational environment by promoting discipline and cooperation
- Consulted with and supported students to help address and solve problems, both technical and personal issues
- Collaborated with other TA's and instructors for the design and implementation of teaching material

Research Intern
March 2016 – July 2016

Institut d'Astrophysique de Paris, Paris, France

- Developed a model to test the accuracy of Euclid, an ESA telescope **(Python, Numpy, Matplotlib, Scipy, sklearn)**
- Used a maximum likelihood estimator and a minimization routine in Python to predict optimal galaxy parameters matching the data
- Discovered a discrepancy in part of the data, which would have caused years of delay if uncorrected. Led to a participation in a publication in a peer-reviewed journal

EDUCATION

Ph. D. in Astrophysics
May 2019 – June 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 in High Energy Physics
Sept 2014 – Aug 2016

Sorbonne Université-Université Pierre et Marie Curie, Paris, France

Bachelors of Physics
Sept 2011 – Aug 2014

Université Lille 1, Lille, France

CONTACT

- Waterloo, ON, Canada
- +33676677693/+12269783575
- amourayuba@gmail.com
- Linkedin
- GitHub
- Personal website

TECHNICAL SKILLS

7+ years Python: Numpy, Scipy, Matplotlib, Jupyter. LaTeX, Linux
4 years Pycharm, OpenCV, sklearn, Pandas, Git/GitHub
1 year R, SQL, C/C++, Matlab

ML Projects

- Classification competition: detecting windmills from satellite images. Used a superlearner with svm, random forest and glm. 91% accuracy obtained **(R, Python, OpenCV)**
- K-means image size reduction. Reducing number of colors with minimal impact on quality **(Python, Pycharm, OpenCV)**
- PCA to predict which combination of genes are most correlated to different cancer types **(R)**

COMMUNICATION

Fluent in English, French, Berber and Arabic

OTHER

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

SCIENTIFIC PUBLICATIONS

" Cluster Assembly Times as a Cosmological Test", Y. Amoura et al., *Monthly Notices of the Royal Astronomical Society*, Vol. 508, pp.100-117 (2021)

" Euclid preparation. III. Galaxy cluster detection in the wide photometric survey, performance and algorithm selection", EUCLID Collaboration, *Astronomy & Astrophysics*, Vol. 627, 27 pp. (2019)