

## SKILLS

**MACHINE LEARNING:** classification, regression, clustering, forecasting, feature engineering

**SOFTWARE AND PROGRAMMING**

**LANGUAGE:** Python (scikit-learn, numpy, scipy, pandas, pyspark, keras, dask, numba), SQL, Hadoop, Linux, Git, C++

## SUMMARY

Dedicated and trained data scientist with a background in computational astrophysics: experienced in code development for numerical simulation in super-computer clusters and the statistical pipeline for data analysis. I have developed state-of-the-art algorithms to understand the nature of black holes and their feedback to the surrounding medium. I've trained for +550 hours in Bootcamp as a data scientist to reshape my knowledge and skillsets into machine learning and data analysis for industrial topics.

## EMPLOYMENT

### UNIVERSITY OF AMSTERDAM

Postdoctoral Researcher

Amsterdam, Netherlands  
Sep. 2018 to Mar. 2022

- Modeled the black hole physics and analyzed simulated data to evaluate black hole images
- developed and performed a GPU-enabled parallelized simulation code in supercomputer clusters.
- produced synthetic black hole images by using the ray-tracing algorithm and analyzed statistics of black hole features
- co-advised Ph.D. students and supervised a master's student at the University of Amsterdam

### SHANGHAI ASTRONOMICAL OBSERVATORY

PIFI Research Fellow

Shanghai, China  
Nov. 2015 to May 2018

- built a theoretical model of co-evolution between the black hole and its host galaxy and developed python tools to analyze statistics of the black hole feedback effects

### UNIVERSITY OF WISCONSIN-MADISON

Research Assistant

Wisconsin, USA  
Sep. 2009 to Aug. 2015

- designed and tested theoretical black hole jet models using state-of-the-art simulation
- developed python tools to analyze the statistics of the simulated jet features

## PROJECTS

### WEB TRAFFIC TIME SERIES FORECASTING

Dec. 2022 to Jan. 2023

- aimed to predict future web traffic for approximately a total of 145k Wikipedia articles to make better traffic control decisions.
- conducted feature engineering of time series data and built and evaluated forecasting models
- tools and algorithms: SARIMA / Prophet / LSTM
- results: The daily traffic has a strong weekly seasonality and we successfully predicted the next 60 days of traffic by the LSTM model.

### WEST NILE VIRUS PREDICTION

Nov. 2022 to Dec. 2022

- aimed to build a model that predicts outbreaks of West Nile virus in mosquitos using the given environmental conditions, such as weather, season, and location in the City of Chicago
- managed highly imbalanced data by undersampling technique and solved binary classification by building models
- tools and algorithms: Logistic Regression / Random Forest / Bayes / SVM / K-Nearest Neighbors
- results: Given weather data, we successfully predicted the presence of viruses using the Random Forest model. The analysis revealed that wet and warm air could promote a favored environment for mosquito proliferation and thus the virus epidemic.

## EDUCATION

### Springboard Data Science Career Track

Certification 2023

May 2022 to Feb. 2023

8-month intensive course in data science, machine learning, Python and SQL.  
Portfolio Projects: <https://astrodoo.github.io/portfolio/>

### University of Wisconsin-Madison

PhD, Astrophysics

Sep. 2009 to Aug. 2015

### Seoul National University

Master of Science, Astrophysics

Mar. 2006 to Dec. 2008

### Seoul National University

Bachelor of Science, Physics and Astronomy

Mar. 1999 to Dec. 2005