Sothea Has — *Ph.D. in Applied Mathematics*

Office 5028, Bâtiment Sophie Germain
8 place Aurélie Nemours, 75013 Paris, France

https://hassothea.github.io/
sothea.has@lpsm.paris

EDUCATION

France — **CNRS, LPSM - Université Paris Cité & LMD - École Polytechnique**
2022 - Present — *Postdoctoral research under supervision of Riwal Plougonven (LMD - École polytechnique) and Aurélie Fischer (LPSM - Université Paris Cité)*
Research topic — *Improving parameterizations in climate modeling using statistical and machine learning methods.*

France — **Sorbonne University Pierre and Marie Curie - Paris 6**
2018 - 2022 — *Ph.D. in Applied Mathemathics*
Research topic — *Consensual aggregation and distance measurements for statistical learning. Theoretical contributions and applications to the field of energy.*

- Methodology for prediction tasks based on clustering & consensual aggregation methods.
- Kernel-based consensual aggregation method for regression.
- Consensual aggregation of randomly projected high-dimensional features for regression.

France — **University Paris Diderot - Paris 7**
2017 - 2018 — *Master 2 Random Modelling and Data Science (M2MO)*
Project — Data Science for Company, Massive Data Processing (R-programming).
Exam — Statistical Learning, Statistical Modeling, Diffusion Statistics, Stochastic Calculus.
Both — Machine Learning (Python), Monte Carlo Method (C++).

France — **École Nationale Supérieure d'Informatique pour l'Industrie et l'Enterprise - ENSIIE**
2016 - 2017 — *Master 1 Applied Mathematics*
Project — Time Series, Simulation Methods, Research Project in Finance, Machine Learning.
Exam — Stochastic Process, Operation Research, Stochastic Calculus in Finance.
Both — Data Analysis, Numerical Methods for PDE, C++.

Cambodia — **Royal University of Phnom Penh - RUPP**
2014 - 2015 — *Master 1 of Mathematics*
2009 - 2013 — *Bachelor's Degree of Mathematics*

PUBLICATIONS

2022 — Machine learning methods applied to the global modeling of event-driven pitch angle diffusion coefficients during high-speed streams.
Research topic — *Coupled Feedback Mechanisms in the Magnetosphere-Ionosphere System,*
Status — *Published in Frontiers, with G. Kluth, J.F. Ripoll, A. Fischer, M. Mougeot, and E. Camporeale.*

April 2021 — KFC: A clusterwise supervised learning procedure based on aggregation of distances.
Status — *Published in Journal of Statistical Computation and Simulation, with Aurélie Fischer and Mathilde Mougeot.*

2021 — A kernel-based consensual aggregation for regression.
Status — *Under revision.*

2021 — A consensual aggregation on randomly projected high-dimensional predicted features for regression.
Status — *To be submitted.*

EXPERIENCES

2022 - Present — **CNRS - Université Paris Cité & École Polytechnique**
Position — *Postdoctoral research in Gravity Wave Monmentum Flux modeling using machine learning methods.*

2018 - 2022 **LPSM (UMR 8001) - Sorbonne Université**
Position *Ph.D. research in aggregation techniques and data modeling.*

2018 - Present **UFR Mathematics Université de Paris**
Position *Teaching assistant and ATER*
- Practical class of Data Analysis with R and R-studio, M1ISIFAR.
- Practical class of Data Mining with R and R-studio, M2ISIFAR.
- Practical class of Exploratory Data Analysis with R and R-studio, M1 EDA.
- Practical class of Algorithm and Programming with Python, L2 MIASHS.
- Practical class of Big Data Technologies with Python and Spark, M1MATINF.
- Tutorial class of Statistical Inference and Data Modeling, M2MO.

2018 **LPSM (UMR 8001) Université de Paris**
April - Sep *M2 internship: predictive models based on clustering with Bregman divergences and local predictions*
Analysis of sensitivity of K-means clustering with Bregman divergences on several types of datasets. Numerical study of a two-step prediction procedure inspired by energy modeling: the clustering structure of the input data is estimated using K-means with Bregman divergences in the first step, then simple local predictive models are fitted in the second step.

2017 **Laboratory of TELECOM SudParis**
June - Sep *M1 internship: Optimization Problem with Simulated Annealing Algorithm*
Understanding the convergence property of simulated annealing algorithm, which is a probabilistic method aiming at estimating the global optimizer of a given function (deterministic or non-deterministic).

SCHOLARSHIP & AWARDS

CNRS - IMPT Project
2022 - Present Postdoctoral research funds

LPSM Scholarship
2018 - 2022 Ph.D. and research funds

ENSIIE Scholarship
2017 - 2018 Second year Master's degree of M2MO at Université Paris Diderot (Paris 7)

Erasmus+ Scholarship
2016 - 2017 First year Master's degree of Applied Mathematics at ENSIIE, France

International Mathematics Union (IMU)
2014 - 2016 2-year Master's degree of Pure Mathematics at Royal University of Phnom Penh

Ministry of Education of Cambodia Scholarship
2009 - 2013 4-year Bachelor's degree of Mathematics at Royal University of Phnom Penh

LANGUAGES & PROGRAMMING

Languages Khmer (Mother tongue), English (fluent), French (conversational)
Programming R : `tidyverse`, `dplyr`, `ggplot`, `plotly`, ...
Python : `TensorFlow`, `pandas`, `scikit-learn`, `PySpark`, ...
Others : C++, Matlab, Scilab, LaTeX.

PERSONAL INTEREST

Reading Behavioral science, self-discipline and new discoveries.
Sports Volleyball, basketball and football.
Other interests Music, guitar, a little bit piano and drum, drawing.