

# Sothea Has

*Ph.D. in Applied Mathematics*

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## 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 Mathematics*  
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 Momentum 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

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2022 - Present **CNRS - IMPT Project**  
Postdoctoral research funds

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

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

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


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

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

## LANGUAGES & PROGRAMMING

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Languages Khmer (Mother tongue), English (fluent), French (conversational)

Programming  : tidyverse, dplyr, ggplot, plotly, ...  
Python : TensorFlow, pandas, scikit-learn, PySpark, ...  
Others : C++, Matlab, Scilab, L<sup>A</sup>T<sub>E</sub>X.

## PERSONAL INTEREST

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Reading Behavioral science, self-discipline and new discoveries.

Sports Volleyball, basketball and football.

Other interests Music, guitar, a little bit piano and drum, drawing.