EL MEHDI HARESS

PhD application for the XXXXX department of XXXX University
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EDUCATION

MSc program (Mathematics of Randomness) - Paris-Saclay University, Gif-sur-Yvette, France *September 2020 - Present*
Specializing in Probability and Statistics.
Relevant coursework includes : *Statistical Learning Theory, Brownian Motion and Stochastic Calculus, Convex Analysis and Optimization Theory, Non-Parametric Estimation, Non Parametric Bayesian Statistics.*
GPA : XXX.

CentraleSupélec - Gif-sur-Yvette, France, One of France's top leading universities for science *September 2017 - Present*
Major in applied mathematical sciences.
Relevant courses include : *Advanced probability, Statistics, Numerical Models for Finance, Stochastic Differential Equations, Optimization and Variations Calculus.*
GPA : 3.925 , Major GPA : XXX

Preparatory program - Lycée Pierre de Fermat, Toulouse, France *September 2015 - June 2017*
A post-secondary (two-year) program in advanced math and physics leading to nationwide entrance examinations to the Grandes Ecoles for scientific studies.
Math/ Physics/ Engineering Sciences/ Computer Science.
GPA : 4.0

High school - Groupe scolaire Berrada - Morocco *September 2012 - June 2015*
Baccalaureate in sciences obtained with highest honors.

RESEARCH PROJECTS

Parametric and non-parametric estimation in a stochastic differential equation - CentraleSupélec *September 2020 - Present*
Supervised by Alexandre Richard, researcher at MICS : CentraleSupélec's research laboratory in Mathematics and Computer Science.

- Used the ergodicity theory to estimate the drift and Hurst parameter in Stochastic Differential Equations (SDEs) driven by a fractional Brownian motion (fBm).
- Used stochastic integrals to estimate the drift in SDEs driven by a fBm in a non-parametric setting.

Learning with risk-averse feedback under potentially heavy tailed losses - University of Osaka, Japan *March 2020 - August 2020*
Supervised by Matthew J.Holland.

- Studied robust Spectral risk measures (SRMs) and CPT-value estimators.
- Incorporated SRMs and the CPT-value as a notion of risk in learning algorithms.
- Implemented a converging stage-wise gradient descents that seek to minimize the SRM or the CPT risk.

Paper was submitted to XXXXXX, Publication pending
Preprint link : XXXXXXXXXXXX

Learning with CVaR-feedback under potentially heavy tailed losses - University of Osaka *March 2020 - August 2020*
Supervised by Matthew J.Holland.
- Studied robust CVaR estimators.
- Analyzed gradient descents with CVaR as risk.
- Implemented a fast converging algorithm that seeks to minimize the CVaR risk.

Paper was submitted to NeurIPS 2020, Publication pending
Preprint link : https ://arxiv.org/abs/2006.02001

Estimation of all the parameters in the Ornstein-Uhlenbeck equation using discrete observations of the solution - University of Alberta, Edmonton, Canada *September 2019 - January 2020*
Supervised by Yaozhong Hu, Department of Mathematics and Statistical Sciences.
- Used the ergodicity of the solution to build almost surely converging estimators.
- Studied the asymptotic behavior of the estimators
- Studied numerically the performance of the estimators.

Paper submitted to SISP (Statistical Inference for Stochastic Processes) Decision pending
Preprint link : https ://arxiv.org/abs/2004.05096.

Density of the solution of the stochastic Skorokhod problem - CentraleSupélec *September 2017 - June 2019*
Supervised by Alexandre Richard.
- Proof of the existence and uniqueness of the solution's density when the Hurst parameter is bigger than $\frac{1}{2}$.

How to choose and build a noise barrier - CentraleSupélec *May 2019*
The importance of fractal geometry in the construction of noise barriers.

Simulation and prediction of the propagation of the Tuberculosis in three bounded countries - CentraleSupélec *Janvier 2019 - Février 2019*
Epidemiological study of the Tuberculosis and its means of transmission.

Game theory project - Preparatory Program *September 2016 - June 2017*
Study of the Wythoff game and generalization of its rules.
- Analysed a new game that is a Nim sum of Nim's game and Wythoff's game.
- Generalized Wythoff's and found the 'best' way to solve it.

SKILLS

IT skills/Programming
Python, Matlab, R, FreeFem++, Latex.

Languages
Arabic : Mother tongue **French** : Bilingual **English** : TOEFL 107 **Japanese** : Intermediary

OUTSIDE ACTIVITIES

Teaching Experience :

Tutoring first-year students - CentraleSupélec *September 2017 - June 2019*

Provided help for students who had issues following the math courses.

"Médiation scientifique" project at Palais de la Découverte - Paris *September 2018 - Otcober 2018*

Member of a team tasked with a scientific vulgarization project that was presented to the general public.

Sport :

Volleyball - CentraleSupélec *September 2017 - Present*

Member of the CentraleSupélec volleyball team.

Student Association :

Annual magic show - CentraleSupélec *September 2018 - June 2019*

Preparation and performance in a magic show.

Professional Experience :

Internship in a Hotel - Japan *June 2018 - August 2018*

One month of Japanese classes in Tokyo followed by two months working in a hotel in Yamanakako.