EL MEHDI HARESS

Application for PhD program in XXXX
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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 leading universities for science *September 2017 - Present*
Major in applied mathematical sciences.
Relevant coursework includes : *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 - Casablanca, 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, 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 descent that seeks 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, Japan *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*

- Understood the importance of fractal geometry in the construction of noise barriers.
- Implemented iterations of different fractals.
- Studied the propagation of sound waves on fractal walls.

Simulation and prediction of the propagation of Tuberculosis in three bounded countries - CentraleSupélec *January 2019 - Februrary 2019*

- Epidemiological study of Tuberculosis and its means of transmission.
- Modeled the phenomenon in the form of differential equations.
- Solved the equations numerically and predicted the evolution of the disease.

Game theory project - Preparatory Program, Toulouse, France *September 2016 - June 2017*

- Studied the Wythoff game.
- Analyzed a new game that is a Nim sum of Nim's game and Wythoff's game.
- Generalized Wythoff's game 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 :
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.

Professional Experience :
Internship in "Dog Resort Woof" (Hotel) - Japan *June 2018 - August 2018*
One month of Japanese classes in Tokyo followed by two months working in a hotel in Yamanakako.