

Thibaut Montes

montest.github.io | montest@lpsm.paris

RESEARCH PROJECTS

OPTIMAL QUANTIZATION

- New **Weak Error** bounds and expansions for **Optimal Quantization** (Published in *Journal of Computational and Applied Mathematics*: [link](#)).
- Optimize existing methods in order to build optimal quantizers: **Fixed Point Research Acceleration, Gradient descent**.
- **Quantization**-based Bermudan option pricing in the FX world (Paper Submitted: [arXiv link](#)).
- Stationary Heston model: Calibration and Pricing of exotics using **Product Recursive Quantization** (Paper in progress).

MULTILEVEL MONTE-CARLO

- Optimizing xVA's risk (counterparty risk) computation using Multilevel Monte-Carlo that allows us to *kill the bias* while *reducing the variance* of the estimator.

LINKS

Website:// montest.github.io

Github:// [montest](https://github.com/montest)

LinkedIn:// [thibaut-montes-194a77a9](https://www.linkedin.com/in/thibaut-montes-194a77a9)

SKILLS

PROGRAMMING

- Over 5000 lines: **C++** (Creation of libraries) \diamond **LaTeX**
- Over 1000 lines: **Python** (Binding of C++ libraries using Pybind11 - **PyTorch**) \diamond **Scala** (just for fun)
- Discovering: **Kafka** \diamond **MongoDB**

LANGUAGES

- French: native
- English: fluent

INTERESTS

Running \diamond Trails

EDUCATION

PHD CIFRE IN NUMERICAL PROBABILITY | LABORATOIRE DE PROBABILITÉS, STATISTIQUES ET MODÉLISATION (LPSM) | SORBONNE UNIVERSITY (EX PARIS VI)

Mar 2017 – Feb 2020 (expected) | Paris, France

Under the direction of **Gilles Pagès** and **Vincent Lemaire** at the LPSM and the supervision of **Jean-Michel Fayolle** at the Independent Calculation Agent, a Fintech whose aim is to efficiently compute risk measures linked to counterparty default. My research subjects are Optimal Quantization, also known as K-means, and Multilevel Monte-Carlo methods.

RESEARCH MASTER IN PROBABILITY AND FINANCE (WITH HONORS) | SORBONNE UNIVERSITY (EX PARIS VI) IN COLLABORATION WITH ECOLE POLYTECHNIQUE

Sep 2014 – Jun 2016 | Paris, France

- Numerical Probability (Monte-Carlo, Sensitivities Computation, ...).
- Stochastic Algorithms (Stochastic Gradient Descent, ...).
- Stochastic Calculus and Control.
- Machine Learning.

BACHELOR DEGREE IN MATHEMATICS (WITH HONORS) | AIX-MARSEILLE UNIVERSITY

Sep 2011 – Jun 2014 | Paris, France

Third year of the Bachelor on exchange with the ERASMUS program in the Lund University's mathematics department, Lund, Sweden.

PROFESSIONAL EXPERIENCE

QUANTITATIVE RESEARCHER | THE INDEPENDENT CALCULATION AGENT

From Nov 2016 | Paris, France

As PhD candidate in collaboration with The ICA, I worked on the following projects:

- Optimizing the ICA's analytic library using Optimal Quantization based methods (Pricing of Exotic Options in the interest rate world).
- Identifying and *killing* bias in the xVA computation using Multilevel Monte-Carlo methods.
- Implementing new regulatory risk measures in the library.

INTERN | THE INDEPENDENT CALCULATION AGENT

May 2016 – Oct 2016 | Paris, France

Optimization of financial products pricing and risk measures sensitivities computations (Malliavin calculus and finite differences methods).

INTERN | LPSM (FORMER LPMA), UNDER THE DIRECTION OF DAPHNÉ GIORGI AND VINCENT LEMAIRE

Jun 2015 – Jul 2015 | Paris, France

Numerical simulation of short rate models (Vasicek Model) using trinomial trees. The results of the project can be accessed at the following link: **Trinomial Trees Simulation**