

# Thibaut Montes

montest.github.io | montest@lpsm.paris

## RESEARCH PROJECTS

### OPTIMAL QUANTIZATION

- New error bounds for **optimal quantization based cubature formula** and weak error development (Paper in progress).
- Build a hybrid quantization tree for a Randomized Heston Model using **Product Recursive Quantization** (Paper in progress).
- Optimize existing methods in order to build optimal quantizers: **Fixed Point Research Acceleration**.

### 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

Webpage:// [montest.github.io](http://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++ ♦  $\LaTeX$
- **Over 1000 lines:**  
Scala ♦ Python ♦ Matlab
- **Discovering:**  
Kafka ♦ MongoDB

### LANGUAGES

- French: native
- English: fluent

## INTERESTS

Running ♦ Trails

## EDUCATION

### PHD CIFRE IN NUMERICAL PROBABILITY | LABORATOIRE DE PROBABILITÉS, STATISTIQUES ET MODÉLISATION (LPSM) | PIERRE ET MARIE CURIE UNIVERSITY (PARIS VI)

Mar 2017 – Mar 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) | PIERRE ET MARIE CURIE UNIVERSITY (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

I spent the 2013-2014 academic year on exchange with the ERASMUS program in the Lund University's mathematics department, Lund, Sweden.

## PROFESSIONAL EXPERIENCE

### QUANTITATIVE ANALYST | 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

The goal of my internship was to optimize financial products price and risk measures sensitivities computations. I investigated both Malliavin calculus and finite differences methods and concluded the latter offered the best optimization.

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

Jun 2015 – Jul 2015 | Paris, France

I explored short rate models (Vasicek Model) and their numerical simulation using trinomial trees. The results of the project can be accessed at the following link:

**Trinomial Trees Simulation**