Thibaut Montes

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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.

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 – June 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 – June 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