Abass SAGNA. Associate Professor at the Engineering School ENSIIE, France

Laboratoire de Mathématique et Modélisation d'Evry (LaMME) Evry University

Phd Thesis in Applied Probability at *Paris 6 (Pierre et Marie Curie) University*.

First name : Abass

Surname : SAGNA

Birht day : 03/21/1977

Place of birth : Dakar (Senegal)

Nationality : Senegalese

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PROFESSIONAL POSITION

Actual position : Associate Professor (Maître de conférences), since Sept. 2009, at the Engineering School ENSIIE (School of *Applied Mathematics and Computer Science*). Researcher at the Laboratory "Mathématiques et Modélisation de l'Université d'Evry " at Evry University.

Professional address : ENSIIE
1 Square de la Résistance
91025 Evry

Laboratoire de Mathématiques et
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23 Boulevard de France, 91037 Evry

EDUCATION AND RECENT DEGREES

12/2005-12/2008 *PhD Thesis at Paris 6 University* with Professor Gilles Pagès in Applied Mathematics : **Optimal quantization methods and Applications to Quantitative Finance**. *Mention très honorable* (second level of distinction for PhD. The first level of distinction is now any more delivered in the laboratory).

Members of the Jury :

Jean-Claude	FORT	Professor at Paris 5 University
Jean	JACOD (foreman of the jury)	Professor at Paris 6 University
Antoine	LEJAY	Researcher in the INRIA project-team TOSCA
Harald	LUSCHGY	Professor at Trier University, Germany
Gilles	PAGÈS (advisor)	Professor at Paris 6 University
Huyên	PHAM	Professor at Paris 7 University
Jacques	PRINTEMS	Assistant Professor at Paris 12 University

2004-2005 Master 2 "Modélisation Aléatoire" (Random Modeling) at Paris 7 University. *Upper second class honors* (Mention Bien).

2003-2004 Master 1 "Ingénierie Mathématique" (Mathematical Engineering) with option "Applied Statistics", at Toulouse 3 (Paul Sabatier) University. *Second class honors* (Mention assez bien).

BOOK

- (With A. Diop, A. Diop, S.T. Sall). Introduction aux probabilités discrètes et à la statistique descriptive : March, 2022, l'Harmattan : " The book gives the fundamentals on discrete probabilities and Statistics for first and second year students in Science. It may be used us teaching material as well. To make easier the understanding of definitions and results, we have tried throughout the chapters to give examples or applications following each definition and result.

PUBLICATIONS ET PRÉ-PUBLICATIONS

My topics of interest are : *Quantitative finance, Nonlinear filtering, Optimal vector quantization theory and its applications, Functional quantization for numerical probability*.

- (with Cheikh MBAYE and Frédéric Vrins). A general firm-value model under partial information. *Journal of computational Finance*. To appear.
- (with G. Pagès). Weak and strong error analysis of recursive quantization : a general approach with an application to jump diffusions. *IMA Journal of Numerical Analysis*, 41 (4), 2668-2707, (2021) : https ://doi.org/10.1093/imanum/draa033.
- (with L. FIORIN et G. Pagès). Markovian and product quantization of an $\mathbb{R}^d$-valued Euler scheme of a diffusion process with applications to finance. *Methodol Comput Appl Probab* (2019) 21 : 1087. https ://doi.org/10.1007/s11009-018-9652-1.
- (with G. PAGÈS). Improved error bounds for quantization based numerical schemes for BSDE and nonlinear filtering. *Stochastic Processes and their Applications*, 128, 847-883, (2018).
- (with G. PAGÈS). Recursive Marginal Quantization of the Euler Scheme of a Diffusion Process. *Applied Mathematical Finance*, 22(15), 463-498 (2015).
- (with C. PROFETA). Conditional hitting time estimation in nonlinear filtering model by Brownian Bridge method. *Stochastics An International Journal of Probability and Stochastic*, 87(1),112-141 (2015).
- (with G., CALLEGARO). An application to credit risk of a hybrid Monte Carlo-optimal quantization method. *The Journal of Computational Finance*, 16, 123-156, (2013).
- (with N. FRIKHA). Quantization based recursive Importance Sampling. *Monte Carlo Methods and Applications*, 18, 287-326 (2012).
- A. SAGNA. Pricing of barrier options by marginal functional quantization method. *Monte Carlo Methods and Applications*, 17(4), 371-398 (2012).
- (with G. PAGÈS). Asymptotics of the maximal radius of an L^r-optimal sequence of quantizers. *Bernoulli*, 18(1), 360-389 (2012).
- A. SAGNA. Universal L^s-rate-optimality of L^r-optimal sequence of quantizers by dilatation and contraction, *ESAIM PS*, 13, 218-246 (2009).

AS A SPEAKER IN A CONGRESS OR A SEMINARY

- Invited researcher at Padoue university, Italy, from Jun, 24th, to Jun, 26th, 2019.
- *One month CIMPA school, April 2017, University of d'Ibadan, Nigeria*. Lectures on : 1. Optimal quantization. 2. Introduction to Lévy processes, simulation and applications to Finance.

- Invited researcher at Padova university, Italy, from Jan., 12th, to Jan., 17th, 2015.
- Invited researcher at Padova university, Italy, from Jun, 8th, to Jun, 12th 2015.
- Chairman and speaker at "the *2014 SIAM Conference on Financial Mathematics & Engineering", November 13-15, 2014, The Palmer House, Chicago*. Title of my talk : the Recursive marginal quantization of an Euler scheme with applications to local volatility models.
- Summers school on Markov chains at Universidad Central de Ecuador, Equador, Oct. 2014.
- Talk on : "The Conditional hitting time estimate by Brownian Bridge method" at " *the 1st International Congress on Actuarial Science and Quantitative Finance*. Universidad Nacional de Colombia, Jun, 17th-20th, 2014.
- Talk at the *Sino-French Research Program in Financial Mathematics*, Jun 2013, Beijing, on Marginal quantization of an Euler diffusion process and its applications.
- Talk on the pricing of barrier options by marginal fonctionnal quantization method, Oct. 2010, at Evry University, French.
- Talk on the asymptotic of the maximal radius sequence of L^r-quantizers, University of Marne la Vallée, French, Avril 2009.
- Talk on : Introduction to optimal quantization and some applications to Finance. University of Evry, French, Mars 2009.
- Talk on the asymptotic of the maximal radius sequence of L^r-quantizers, University of Angers, French, Mars 2009.
- Talk on an hybrid Monte Carlo-Quantification method with application to credit risk at the working group Numerical Probability : Paris 6 and Paris 7 universities, Feb. 2009.
- Member of the organizing committee and speaker at the "Symposium on Optimal Quantization and Applications to Mathematical Finance", Sept., 01th-02th, 2008, Paris. Title of my talk : Asymptotics of the maximal radius sequence of an L^r-optimal sequence of quantizers.
- Talk at the young probabilists colloquium, Aussois, French, Avril 2008 on the 'Asymptotics of the maximal radius sequence of an L^r-optimal quantizer'.
- Talk at the working group "Numerical Probabilty and Finance" of Paris 6 - Paris 7 on the Asymptotic of the maximal radius sequence of an L^r-optimal quantizer.
- Talk on the "L^s-rate optimality of L^r-optimal quantizers" , "vector Quantization and application to the pricing of american options", "Pricing of european options in prence of jumps" at the working group of Phd students of the Lab PMA of Paris 6 - Paris 7 universities.

As a participant to a colloquium

- Enlargement of filtrations and applications to finance and assurance, May, 31th - Jun, 4th, 2010, at Jena (Germany).
- "Couverture en présence d'illiquidité du marché", April, 16th, 2010, French.
- "Numerical Methods in Finance, An Amamef Conference", April, 15th-17th at l'Ecole des ponts, French.
- "Second International Financial Research Forum, Risk management and Financial Crisis", Paris, March, 19th - 20th, 2009.
- "Symposium on Optimal Quantization and Applications to Mathematical Finance" Sep., 1th - 2th, 2008.
- "Colloque des jeunes probabilistes", Aussois, Avril 2008, French.
- Institut Europlace de la Finance : "4th and 5th International scientists meeting", Jun, 22th 2006 and Jun12th, 2007. Paris.
- "Stochastic Processes and their Applications (SPA)", Paris 2006.
- Numerical Methods in Finance, An Amamef Conference, Feb., 1th - 3th, 2006, at Inria-Rocquencourt, Paris.

TEACHING

My actual teaching courses at the Engineering School ENSIIE are :

- Courses and Seminars on : *Martingales and Markov chains* (Master 1 level).
- Courses and Seminars on : *Probability and Statistics*, Bachelor level.
- Courses and Seminars on : Simulation methods, Master 1 level.
- *Seminars on Crytography and Coding theory*, Master 1 level : from 2012 to 2014.
- *Practical Sessions on C programming*, Bachelor level : from 2012 to 2014.

From 2013 to 2019. Course and Seminars on *Probability* (second year level) at Evry University.

From 2018 to 2018. Course and Seminars on Mathematics for infographic at the Engineering School ESP of Dakar, Senegal.

From 2015 to 2017. Seminar on *Computer Science Projects* at the level 2 ISIFAR Master of Paris 7 University.

From 2011 to 2017. Course and Seminars on *Financial Mathematics* (Master 2 level) at the Engineering School TELECOM SudParis.

22-10-2008 Introduction course to Optimal Quantization and its applications to Finance at the Engineering School Ecole Nationale Supérieure des Mines de Paris, Master 2 level.

2007-2008 ATER at Paris 6 University (A temporary position as Teacher and Researcher). Taught courses :

- L345 (L3) : Seminars on probability and statistic (Bachelor level).
- L346 (L3) : Practical Works on Processes and Simulations (Bachelor level).
- L250 (L2) : Seminars on Sequences, Series and Integrals (second year level).

2006-2007 Moniteur UPMC, Paris 6 University. Seminars on Sequences, Series and Integrals at Paris 6 University.

2005-2006 Moniteur UPMC, Paris 6 University. Seminars on Sequences, Series and Integrals at Paris 6 University.

AS A ADVISOR

From 2010 to 2019, I have advised

- The Master Thesis of 4 students : three from the Engineering School TELECOM SudParis, French and one from AIMS Institute of Mathematical Sciences, Senegal.
- I have advised the second year academic projects of 4 students of the Engineering School ENSIIE.
- I have advised the last year academic project of three groups of students at the Engineering School TELECOM SudParis, French where I take part in teaching of the Unit "Financial Mathematics"

SOFTWARES AND LANGUAGE KNOWLEDGE

- Great programmer in *C language* and a good knowledge of *C++ language*.
- Good knowledge of *SAS and Scilab softwares*.
- User of *R, Python and Matlab software*.

SPOKEN LANGUAGES

- *French* : Fluent in speech, hight levels of reading and writing ability.
- *English* : high level of reading, intermediate levels of speaking and writing ability
- *Arabic* : high level of reading, intermediate levels of speaking and writing ability
- Fluent in speech of two senegalese national languages : *mandinka* and *wolof*.