CURRICULUM VITA

Last name: **AYACHE** First name: **Antoine** Date of birth: **09/22/1969**

Professional address: **Bâtiment M2, Cité Scientifique,**
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CURRENT POSITION

Professor in Applied Mathematics, at the **University of Lille**[1] **(Lille, France)**; I was « Professeur des Univeristés deuxième classe » from 09/1/2004 to 08/31/2016, then I was promoted to « Professeur des Univeristés première classe », and I will be promoted to « Professeur des Univeristés classe »on 10/1/2023.

- Most of my research activities takes place at the « UMR CNRS 8524, Laboratoire Paul Painlevé » (the research unit in Mathematics at the University of Lille) (`https://www.pluginlabs-hautsdefrance.fr/en/fiche/the-paul-painleve-laboratory/`).
→ For the period from 10/1/2022 to 09/30/2025, **I receive each month an individual premium for my research activities and my PhD supervision** « prime individuelle du régime indemnitaire des personnels enseignants et chercheurs (RIPEC) » .
→ For the period from 10/1/2004 to 09/30/2020, **I received each three months an individual premium for my research activities and my PhD supervision** « Prime d'Encadrement Doctoral et de Recherche (PEDR) ».

- Most of my teaching activities takes place at the « Institut de l'Administration des Entreprises (IAE) de Lille » (the department of management sciences at the University of Lille) (`https://iaelille.fr`).

PREVIOUS POSITIONS

- Assistant Professor « Maître de Conférences » in Mathematics from 09/1/1999 to 08/31/2004 at the « Laboratoire Statistique et Probabilités[2] » (the research unit in Statistics and Probability) of the **University Paul Sabatier (Toulouse, France)**.

→ From 09/1/2003 to 08/31/2004, I was on a research mission « délégation » **at the CNRS** (the French National Center for Scientific Research) in the research unit CMLA (Center of Mathematics and Their Applications) of **« Ecole Normale Supérieure de Cachan »**.

[1] Prior to January 2018 the name of the University was: University Lille 1.
[2] Notice that the name of this research unit has now become « Equipe Statistique et Probabilités ».

- Full time « ATER » (this is a French equivalent to a post-doc position with teaching activities), at the research unit CEREMADE (Research Center of Mathematics for Decision Making) of the **University Paris Dauphine**, from 09/1/1997 to 08/31/1999.

- Associate researcher within the former « projet Fractales » (Fractal project) at INRIA (the French National Institute for Research in Computer Science and Control) Rocquencourt, from 01/1/1999 to 08/31/1999.

- PhD fellowship, from 10/1/1994 to 08/31/1997.

DIPLOMAS

- Habilitation Thesis in **Applied Mathematics** (this is the required diploma in France for supervising PhD students and for applying to a position of professor).
Title: **Beyond fractional Brownian motion.** Date: **12/15/03.** Place: **University Paul Sabatier.** Research director: **Professor Y. Meyer.** President of the jury: **Professor C. Houdré**. Referees: **Professors K.J. Falconer, S. Jaffard and M.A. Lifshits**. Other members of the jury: **Professors A. Bonami and M. Ledoux.**

- PhD Thesis in **Applied Mathematics** (passed with distinction).
Title: **Non separable, multivariate, compactly supported, orthonormal wavelet bases with an arbitrary regularity.** Date: **12/3/97.** Place: **University Paris Dauphine.** Supervisor: **Professor Y. Meyer.** President of the jury: **Professor P. Le Tallec**. Referees: **Professors I. Daubechies, A. Cohen and P.G. Lemarié-Rieusset.**

- « DEA » (post-graduate diploma) in **Pure Mathematics** (passed with distinction).
I obtained my diploma in **June 94** at the **University Paris-Sud Orsay.**
It was required to pass 2 courses and write a « DEA » thesis. In order to acquire a double competence: **in Analysis** (Harmonic Analysis and Functional Analysis) **and Algebra** (basic Algebraic Geometry), I passed 5 courses and wrote my « DEA » thesis.

- « Grande école » ENSAE (this is an engineering school at Master level specializing in professional training in **Statistics** and **Economics**; its students are highly selected).
I obtained my degree in **June 93.**

- « DEA » in **Stochastic Modeling Economics and Finance.**
Place: **University Paris VII.** In order **to strengthen my knowledge in Probability, in Statistics and their applications**, I passed half of the required courses of this « DEA », while working on my PhD Thesis. These courses concern **stochastic calculus**

and methods for evaluating options in financial markets.

- Master's degree in **Pure Mathematics** (passed with distinction).
I obtained my degree in **June 91** at the **University Paris VI.**
Courses: Topology, Functional Analysis, Commutative Algebra, Quadratic forms & classical groups.

- Undergraduate studies

- « **Licence** » (third year) in **Applied Mathematics** (passed with distinction).
  I obtained my degree in **June 90** at the **University Paris Dauphine.**
  Courses: Probability, Statistics, Computer Science, Automatics, Differential Systems, Hilbertian Analysis, Measure Theory and Integration, Metric Spaces.

- « **DEUG** » (first and second years) in **Applied Mathematics and Social Sciences** (passed with distinction).
  I obtained my degree in **June 89** at the **University Paris Dauphine.**

- « Baccalauréat » (secondary school examination qualifying for entry to university) **Mathematics and Physics orientation** (passed with distinction).
I obtained my diploma in **July 87.**

MAIN RESEARCH TOPICS

- Sample path behavior of multifractional[3] and anisotropic[4] fields:
→ Global, local and pointwise Hölder regularity
→ Law of the iterated logarithm

- Statistical inference for multifractional and anisotropic fields:
→ Hölder exponents and generalized quadratic variations
→ Hölder exponents and wavelet coefficients
→ Central Limit Theorems

- Random series:
→ Wavelet strategies for studying global and local path behavior
→ Operator theory and optimal series representations of stochastic fields

- Local times:

[3]They are stochastic fields of a fractal nature, which extend fractional Brownian motion and have a path roughness (Hölder regularity) which changes from point to point.

[4]They are stochastic fields of a fractal nature, which extend fractional Brownian motion and have a path roughness (Hölder regularity) which changes from one direction to another.

→ Local nondeterminism property for anisotropic and multifractional fields
→ Existence, joint continuity and Hölder conditions for their local times

- **Fractal dimensions:**
→ Graphs, images and level sets

- **Lifetime Value in Relationship Marketing:**
→ Stochastic modelling

LIST OF PUBLICATIONS IN MATHEMATICS

1) Ayache A., Bouly F. ; Uniformly and strongly consistent estimation for the random Hurst function of a multifractional process. To appear in *ALEA, Latin American Journal of Probability and Mathematical Statistics*.

2) Ayache A., Tudor C.A. ; Asymptotic normality for a modified quadratic variation of the Hermite process. To appear in *Bernoulli*.

3) Ayache A., Bouly F. ; On local path behavior of Surgailis multifractional processes. *Theory of Probability and Mathematical Statistics* 106:3-26 (2022).

4) Ayache A., Bouly F. ; Moving average Multifractional Processes with Random Exponent: lower bound for local oscillations. *Stochastic Processes and their Applications* 146:143-163 (2022).

5) Ayache A., Fradon M., Nanayakkara R., Olenko A. ; Asymptotic normality of simultaneous estimators of cyclic long-memory processes. *Electronic Journal of Statistics* 16:1:84-115 (2022).

6) Ayache A. ; On the monofractality of many continuous Gaussian fields. *Journal of Functional Analysis* 281:7:(32 pages) (2021).

7) Ayache A., Esmili Y. ; Wavelet-type expansion of generalized Rosenblatt process and its rate of convergence. *Journal of Fourier Analysis and Applications* 26:3:(35 pages) (2020).

8) Ayache A. ; Lower bound for local oscillations of Hermite processes. *Stochastic Processes and their Applications* 130:8:4593-4607 (2020).

9) Alomari H.M., Ayache A., Myriam F., Olenko A. ; Estimation of cyclic long-memory parameters. *Scandinavian Journal of Statistics* 47:1:104-133 (2020).

10) Ayache A., Shieh N.R., Xiao Y. ; Wavelet series representation and geometric properties of harmonizable fractional stable sheets. *Stochastics* 92:1:1-23 (2020).

11) Ayache A. ; Multifractional stochastic fields: wavelets strategies in multifractional frameworks (book of 236 pages for researchers and young researchers in Mathematics). *World Scientific* (2019).

12) Ayache A., Esser C., Kleyntssens T. ; Different possible behaviors of wavelet leaders of the Brownian motion. *Statistics and Probability Letters* 150:54-60 (2019).

13) Ayache A., Hamonier J. ; Wavelet series representation for multifractional multistable Riemann-Liouville process. *Mathematical Methods in Economics and Finance* 13/14:1:(17 pages) (2018/2019).

14) Ayache A., Esser C., Peng P. ; Almost sure approximations in Hölder norms of a general stochastic process defined by a Young integral. *ALEA, Latin American Journal of Probability and Mathematical Statistics* 15:775-810 (2018).

15) Ayache A., Esmili Y. ; Wavelet analysis of a Multifractional process in an arbitrary Wiener chaos. *Theory of Probability and Mathematical Statistics* 98:1:29-50 (2018).

16) Ayache A., Esser C., Hamonier J. ; A new multifractional process with random exponent. *Risk and Decision Analysis* 7:5-29 (2018).

17) Ayache A., Hamonier J. ; Behaviour of linear multifractional stable motion: membership of a critical Hölder space. *Stochastics* 89:5:709-725 (2017).

18) Ayache A., Esser C. ; A useful result related with zeros of continuous compactly supported mother wavelets. *International Journal of Wavelets, Multiresolution and Information Processing* 15:5:(12 pages) (2017).

19) Ayache A., Boutard G. ; Stationary increments harmonizable stable fields: upper estimates on path behaviour. *Journal of Theoretical Probability* 30:4:1369-1423 (2017).

20) Ayache A., Hamonier J. ; Uniformly and strongly consistent estimation for the Hurst function of a linear multifractional stable motion. *Bernoulli* 23:2:1365-1407 (2017).

21) Ayache A., Xiao Y. ; Hamonizable fractional stable fields: local nondeterminism and joint continuity of the local times. *Stochastic Processes and their Applications* 126:1:171-185 (2016).

22) Ayache A., Hamonier J. ; Linear mutifractional stable motion: wavelet estimation of $H(\cdot)$ and α parameters. *Lithuanian Mathematical Journal* 55:2:159-192 (2015).

23) Ayache A., Hamonier J. ; Linear multifractional stable motion: fine path properties. *Revista Matemática Iberoamericana* 30:4:1301-1354 (2014).

24) Ayache A. ; Sharp estimates on the tail behavior of a multistable distribution. *Statistics and Probability Letters* 83:3:680-688 (2013).

25) Ayache A. ; Continuous Gaussian multifractional processes with random pointwise Hölder regularity. *Journal of Theoretical Probability* 26:1:72-93 (2013).

26) Ayache A., Hamonier J. ; Linear fractional stable motion: a wavelet estimator of the α parameter. *Statistics and Probability Letters* 82:8:1569-1575 (2012).

27) Ayache A., Peng P. ; Stochastic volatility and multifractional Brownian motion. *Stochastic Differential Equations and Processes. Spinger eds Zili and Filatova* 211-237 (2012).

28) Ayache A., Shieh N.R., Xiao Y. ; Multiparameter multifractional Brownian motion: local nondeterminism and joint continuity of the local times. *Annales de l'Institut Henri Poincaré (B) Probabilités et Statistiques* 47:4:1029-1054 (2011).

29) Ayache A., Bertrand P. ; Discretization error of wavelet coefficient for fractal like process. *Advances in Pure and Applied Mathematics* 2:2:297-321 (2011).

30) Ayache A., Bertrand P. ; A process very similar to multifractional Brownian motion *Fractal and Related Fields. Birkhäuser eds Barral and Seuret* 311-326 (2010).

31) Ayache A., Jaffard S. ; Hölder exponents of arbitrary functions. *Revista Matematica Iberoamericana* 26:1:77-89 (2010).

32) Ayache A., Linde W. ; Series representations of fractional Gaussian processes by trigonometric and Haar systems. *Electronic Journal of Probability* 14:94:2691-2719 (2009).

33) Ayache A., Roueff F., Xiao Y. ; Linear fractional stable sheets: wavelet expansion and sample path properties. *Stochastic Processes and their Applications* 119:4:1168-1197 (2009).

34) Ayache A., Linde W. ; Approximation of Gaussian random fields: general results and optimal wavelet representation of the Lévy fractional motion. *Journal of Theoretical Probability* 21:1:69-96 (2008).

35) Ayache A., Tzvetkov N. ; L^p properties for Gaussian random series. *Transactions of the American Mathematical Society* 360:4425-4439 (2008).

36) Ayache A., Wu D., Xiao Y. ; Joint continuity of the local times of fractional Brownian sheets. *Annales de l'Institut Henri Poincaré (B) Probabilités et Statistiques* 44:4:727-748 (2008).

37) Ayache A., Roueff F., Xiao Y. ; Joint continuity of the local times of linear fractional stable sheets. *Comptes Rendus de l'Académie des Sciences de Paris* I:344:10:635-640 (2007).

38) Ayache A., Roueff F., Xiao Y. ; Local and asymptotic properties of linear fractional stable sheets. *Comptes Rendus de l'Académie des Sciences de Paris* I:344:6:389-394 (2007).

39) Ayache A., Jaffard S., Taqqu M.S. ; Wavelet construction of generalized multifractional processes. *Revista Matematica Iberoamericana* 23:1:327-370 (2007).

40) Ayache A., Bonami A., Estrade A. ; Identification and series decomposition of anisotropic Gaussian fields. *More Progresses in Analysis. World Scientific eds Begehr and Nicolosi* 441-450 (2009).

41) Ayache A., Bertrand P., Lévy Véhel J. ; A central limit theorem for the quadratic variations of the step fractional Brownian motion. *Statistical Inference for Stochastic Processes* 10:1:1-27 (2007).

42) Ayache A., Heinrich P., Marsalle L., Suquet Ch. ; Holderian random functions. *Fractals in Engineering New Trends in Theory and Applications. Springer-Verlag eds Lévy Véhel and Lutton* 33-56 (2005).

43) Ayache A., Xiao Y. ; Asymptotic growth properties and Hausdorff dimensions of fractional Brownian sheets. *Journal of Fourier Analysis and Applications* 11:4:407-439 (2005).

44) Ayache A., Taqqu M.S. ; Multifractional processes with random exponent. *Publicaciones Matemàtiques* 49:459-486 (2005).

45) Ayache A. ; Hausdorff dimension of the graph of the fractional Brownian sheet. *Revista Matematica Iberoamericana* 2:20:395-412 (2004).

46) Ayache A., Lévy Véhel J. ; Identification of the pointwise Hölder exponent of generalized multifractional Brownian motion. *Stochastic Processes and their Applications* 111:1:119-156 (2004).

47) Ayache A., Benassi A., Cohen S., Lévy Véhel J. ; Regularity and identification of generalized multifractional Gaussian process. *Séminaire de Probabilités* XXXVIII:290-312 (2005).

48) Ayache A., Taqqu M.S. ; Rate optimality of wavelet series approximations of fractional Brownian motion. *Journal of Fourier Analysis and Applications* 9:5:451-471 (2003).

49) Ayache A., Roueff F. ; A Fourier formulation of the Frostman criterion for random graphs and its application to wavelet series. Letter to the editor, *Applied and Computational Harmonic Analysis* 14:1:75-82 (2003).

50) Ayache A., Léger S., Pontier M. ; Les ondelettes à la conquête du drap brownien fractionnaire. *Comptes Rendus de l'Académie des Sciences de Paris* I:335:12:1063-1068 (2002).

51) Ayache A. ; The generalized multifractional field: a nice tool for the study of the generalized multifractional Brownian motion. *Journal of Fourier Analysis and Applications* 8:6:581-602 (2002).

52) Ayache A., Léger S., Pontier M. ; Drap brownien fractionnaire. *Potential Analysis* 17:1:31-43 (2002).

53) Ayache A. ; Du mouvement brownien fractionnaire au mouvement brownien multifractionnaire (article de synthèse). *Technique et science informatiques* 20:9:1133-1152 (2001).

54) Ayache A., Lévy Véhel J. ; Processus à régularité locale prescrite. *Comptes Rendus de l'Académie des Sciences de Paris* I:333:3:233-238 (2001).

55) Ayache A. ; Some methods for constructing non separable, orthonormal, compactly supported wavelet bases. Letter to the editor, *Applied and Computational Harmonic Analysis* 10:2:99-111 (2001).

56) Ayache A., Cohen S., Lévy Véhel J. ; The covariance structure of multifractional Brownian motion. *Proceedings IEEE-ICASSP* 6:3810-3813 (2000).

57) Ayache A., Lévy Véhel J. ; The generalized multifractional Brownian motion. *Statistical Inference for Stochastic Processes* 3:1-2:7-18 (2000).

58) Ayache A. ; A geometrical solution of a problem on wavelets. *Studia Mathematica* 139:3:261-273 (2000).

59) Ayache A., Lévy Véhel J. ; Generalized multifractional Brownian motion: definition and preliminary results. *Springer-Verlag eds Dekind, Lévy Véhel, Lutton and Tricot* 17-32 (1999).

60) Ayache A. ; Construction of non separable dyadic compactly supported wavelet bases for $L^2(\mathbb{R}^2)$ of arbitrarily high regularity. *Revista Matematica Iberoamericana* 15:1:37-58 (1999).

61) Ayache A. ; Construction de bases d'ondelettes orthonormées de $L^2(\mathbb{R}^2)$ non sé-

parables, à support compact et de régularité arbitraireméemt grande. *Comptes Rendus de l'Académie des Sciences de Paris* I:325:17-20 (1997).

LIST OF PUBLICATIONS IN OTHER AREAS

- BUSINESS SCIENCES

62) Ayache A., Calciu M., Salerno F. ; Lifetime value calculations in continuous time buying contexts using generating functions and Laplace transforms for customer retention models. *26-ème Congrès de l'AFM, Le Mans Angers* (2010).

63) Ayache A., Calciu M., Fradon M., Salerno F. ; Analytic decision support to find optimal balance between customer acquisition and retention spending. *23-ème Congrès de l'AFM, Aix les Bains* (2007).

64) Ayache A., Calciu M., Fradon M., Salerno F. ; Calculs de la valeur du client à l'aide d'une nouvelle approche stochastique et des fonctions génératrices. *22-ème Congrès de l'AFM, Nantes* (2006).

65) Ayache A., Calciu M., Fradon M., Salerno F. ; Stochastic approach to customer Equity and Lifetime Value calculations with applications to customer retention models and some extensions. *EMAC Athens 35-th Conference* (2006).

- SIGNAL and IMAGE PROCESSING

66) Lopes R., Ayache A. ; Tenets, methods and applications of multifractal analysis in neurosciences. *This overview article appeared in a collective book entitled "The fractal geometry of the brain", published by Springer in 2016 and edited by the doctor in neurosurgery Antonio Di Ieva.*

67) Lopes R., Ayache A., Makni N., Puech P., Villers A., Mordon S., Betrouni N ; Prostate cancer characterization on MR images using fractal features. *Medical Physics* 38:1:83-95 (2011).

INVITATIONS OUTSIDE OF FRANCE

- For a period of 6 weeks (December 1999 and January 2000) by Professor W.M. Lawton at **National University of Singapore (Singapore)**.

- For a period of one week (in January 2003) by Professor F. Spizzichino at **Università La Sapienza (Roma, Italy)**.

- For a period of 4 weeks (July and August 2003) by Professor Y. Xiao at **Michigan State University (East Lansing, USA)**.

- Invited speaker (May 2004) at the **Second International Conference on « Computational Harmonic Analysis »** which took place at **Vanderbilt University**

(Nashville, USA).

- Invited speaker (September 2005) at the **International Conference « Small Deviation Probabilities and Related Topics »** which took place at **the Euler International Mathematical Institute (St. Petersburg, Russia)**.

- For a period of 2 weeks (December 2009) by Professor N.-R. Shieh at **National Taiwan University (Taiwan)**.

- Invited speaker (February 2010) at the **Stochastic Analysis Seminar of the University of Oxford (England)**.

- For a period of 1 month (September 2010) by Professor Y. Hu at **Wuhan University (China)**.

- I was invited (December 2010) by Professor S. Bianchi to give during 6 hours seminars at **University of Cassino (Italy)**.

- For a period of 1 week (January 2011) at **the Faculty of Sciences of Monastir (Tunisia)**.

- For a period of 5 days (April 2012) by Professor A. Aldroubi at **Vanderbilt University (Nashville, USA)**.

- For a period of 2 weeks (August and September 2012) by Professor Y. Xiao at **Michigan State University (East Lansing, USA)**.

- Invited speaker (September 2012) at the **Stochastics Seminar of the University of Utah (Salt Lake City, USA)**.

- Invited speaker (December 2014) at the **International Conference « Stochastic Analysis and Applications »** which took place at **Academia de Studii Economice din Bucuresti (Bucharest, Romania)**.

- Invited speaker (May 2016) at the **Workshop « Fractality and Fractionality »** which took place at the **Lorentz Center (Leiden, Netherlands)**.

- For a period of 11 days (April 2017) by Professor Y. Xiao at **Michigan State University (East Lansing, USA)**.

- For a period of 2 weeks (July 2019) by Professor A. Henderson at **the University**

of Sydney (Sydney, Australia).

- For a period of 1 month (August 2019) by Associate Professor A. Olenko at **La Trobe University (Melbourne, Australia)**.

- Invited speaker at the **Conference « Modern Stochastics: Theory and Applications V »** which was planed take place in June 2020 at **Taras Shevchenko National University of Kyiv and National Pedagogical Dragomanov University (Kyiv, Ukraine)**, and which finally held online in June 2021 because of the COVID pandemic.

- Invited speaker (April 2022) at the online **workshop « Random Fields and Their Applications » dedicated to the memory of Professor Mykhailo Yadrenko.**

- Invited speaker (April 2022) at the **Probability & Statistics seminar of the University of Luxembourg (Esch-sur-Alzette, Luxembourg).**

- For a period of 15 days (June and May 2023) by Professor Y. Xiao at **Michigan State University (East Lansing, USA)**.

- For a period of 4 weeks (August 2023) by Associate Professor A. Olenko at **La Trobe University (Melbourne, Australia)**.

INVITATIONS TO SEMINARS IN FRENCH UNIVERSITIES

Amiens (2 times), Besançon, Clermont-Ferrand 2 (2 times), Dijon, Grenoble 1, Lille 1, Nice, Orléans (2 times), Paris 1, Paris 6 (2 times), Paris 12 (2 times), Paris 13 (2 times), Rennes 1, Toulouse 3, and Vannes.

SUPERVISION OF RESEARCH ACTIVITIES

- From September 2007 to November 2011, **I was the PhD supervisor of Peng Qidi**, whose PhD concerns **statistical inference for hidden multifractional processes in a setting of stochastic volatility models.**

- From September 2008 to November 2012, **I was the PhD supervisor of Hamonier Julien**, whose PhD concerns **study through wavelet methods of linear multifractional stable processes.**

- From September 2013 to November 2016, **I was the PhD supervisor of Boutard Geoffrey**, whose PhD concerns **study through wavelet methods of some general**

classes of stable anisotropic fields with stationary increments.

- From September 2017 to June 2020, **I was the PhD supervisor of Esmili Yassine**, whose PhD concerns **study through wavelet methods of some classes of stochastic processes belonging to Wiener chaos.**

- From September 2020 to June 2023, **I was the PhD supervisor of Bouly Florent**, whose PhD concerns **study of non-classical moving average multifractional processes, those having random Hurst functions and those introduced by Surgailis.**

- Since September 2023, **I am the PhD supervisor of Louckx Christophe**, whose PhD concerns **study through wavelet and other methods of harmonizable multifractional stable fields.**

- I have already been **the supervisor of 12 theses in Master 2 Degree in Applied Mathematics.**

PARTICIPATION TO PhD and HABILITATION COMMITTEES

- **Member of the committee of Kaim Michael's PhD** « Propriétés des lois des fonctionnelles définies sur des processus empiriques : conditions d'absolu continuité » defended in the « Université Lille 1 » on September 2005.

- **Referee on Li Xiaolong's PhD** « Etude du processus de Mumford » defended in the « Ecole Normale Supérieure de Cachan » on March 2006.

- **Referee on Barrière Olivier's PhD** « Synthèse et estimation de mouvements browniens multifractionnaires monodimensionnels et bidimensionnels. Etude de processus à régularité prescrite » defended in the « Ecole Centrale de Nantes » on November 2007.

- **Referee and president of the committee of Echelard Antoine's PhD** « Analyse 2-microlocale et application au débruitage » defended in the « Ecole Centrale de Nantes » on November 2007.

- **Referee on Schack Helga's PhD** « An optimal wavelet series expansion of the Riemann-Liouville process » defended in the « Friedrich-Schiller-Universität Jena (Germany) »
on May 2008.

- **Referee on Baraka Driss's PhD** « Propriétés fines des trajectoires du mouve-

ment brownien fractionnaire » defended in the « Ecole Polytechnique Fédérale de Lausanne (Switzerland) » on December 2008.

- **President of the committee of Renaud Lopes's PhD** « Analyse fractale et multifractale en imagerie médicale : outils, validations et applications » defended in the « Université Lille 1 » on October 2009.

- **Member of the committee of Bibi Hatem's PhD** « Construction de bases d'ondelettes de $L^2([0,1])$ et estimation du paramètre de Hurst par la méthode des ondelettes » defended in the « Université Paris 1 » on November 2011.

- **Member of the committee of Peng Qidi's PhD** « Inférence statistique pour des processus multifractionnaires cachés dans un cadre de modèles à volatilité stochastique » defended in the « Université Lille 1 » on November 2011.

- **Member of the committee of Mateï Basarab's Habilitation** « Parcimonie et différents problèmes dans le traitement d'images » defended in the « Université Paris 13 » on December 2011.

- **Member of the committee of Hamonier Julien's PhD** « Analyse par ondelettes du mouvement multifractionnaire stable linéaire » defended in the « Université Lille 1 » on November 2012.

- **Referee on Herbin Erick's Habilitation** « De la régularité locale au comportement global de champs aléatoires » defended in the « Université Paris 11 » on November 2013.

- **Referee on Balança Paul's PhD** « Régularité fine de processus stochastiques et analyse 2-microlocale » defended in the « Ecole Centrale de Paris » on February 2014.

- **Member « garant de l'HDR » of the committee of Tran Viet Chi's Habilitation** « Théorèmes limites pour les populations structurées et leurs généalogies, étude probabiliste et statistique de modèles SIR en épidémiologie, contributions à la géométrie aléatoire » defended in the « Université Lille 1 » on November 2014.

- **Referee on Zeineddine Raghid's PhD** « Change-of-variables formula in law for the fractional Brownian motion in Brownian time (Sur des nouvelles formules d'Itô en loi) » defended in the « Université de Lorraine » on December 2014.

- **Member of the committee of Letemplier Julien' PhD** « Sur la loi de certaines variables aléatoires associées à des processus de Lévy stables » defended in the « Université

Lille 1 » on December 2015.

- **Referee on Croix Jean-Charles's PhD** « A new decomposition of Gaussian Random elements in Banach spaces with application to Bayesian inversion » defended in the « Ecole Nationale Supérieure des Mines de Saint-Etienne » on October 2018.

- **Member of the committee of Kleyntssens Thomas' PhD** « New methods for signal analysis : multifractal formalisms based on profiles from theory to practice » defended in the « Université de Liège (Belgium) » on April 2019.

- **Member of the committee of Slaoui Meyrem' PhD** « Analyse stochastique et inférence statistique des solutions d'équations stochastiques dirigées par des bruits fractionnaires gaussiens et non gaussiens » defended in the « Université de Lille » on November 2019.

- **Referee on Hannebicke Brice's PhD** « Regularity of generalized stochastic processes » defended in the « Ecole CentraleSupélec (Université Paris-Saclay) » on March 2021.

- **Member of the committee of Assaad Obayda' PhD** « Solutions des équations différentielles stochastiques : analyse asymptotique par la méthode de Malliavin-Stein et estimation statistique » defended in the « Université de Lille » on October 2021.

- **Member of the committee of Saës Guillaume' PhD** « Sommes fractales de pulses : Étude dimensionnelle et multifractale des trajectoires et simulations » defended in the « Université de Mons (Belgium) » on January 2022.

- **Member of the committee of Diez Charles-Philippe' PhD** « Quelques théorèmes limites pour les matrices aléatoires, les processus non gaussiens et en probabilités libres » defended in the « Université de Lille » on September 2022.

EDITORIAL ACTIVITIES AND REVIEWING

- Since January 2021, I am **an editor of the international journal *Theory of Probability and Mathematical Statistics***
(`http://probability.univ.kiev.ua/tims/`).

- From January 2010 to March 2018, I was **an editor of the *International Journal of Mathematics and Statistics*** (`http://www.ceser.in/ceserp/index.php/ijms`).

- From August 2012 to June 2015, I was **an editor of the *International Journal of Analysis***.

- I have already been **referee on about one hundred articles** submitted to international journals in mathematics and related fields.

- From 09/1/2003 to 08/31/2004, I was **the administrative responsible for the preprints** of the research unit « CMLA » (Center of Mathematics and Their Applications) of « Ecole Normale Supérieure de Cachan ».

ORGANIZATION OF SEMINARS

- During the two civil years 2012 and 2013, I was one the two directors of **the weekly seminar « Probabilités et Statistiques » (Probability and Statistics)** of the « Laboratoire Paul Painlevé » (the research unit in Mathematics at the University of Lille). During the civil year 2016, I was the deputy director of this same seminar.

- During the academic year 2005-2006, **the Colloquium**[5] **of the « Laboratoire Paul Painlevé »** was under my responsability.

- During the academic year 2002-2003, I participated in **the organization of the seminar « Statistique » (Statistics)** of the « Laboratoire Statistique et Probabilités[6] » (the research unit in Statistics and Probability at the Univeristy Paul Sabatier).

ORGANIZATION OF SCIENTIFIC MEETINGS

- I was one of the five organizers of the **international conference « Scale Invariance and Randomness »** which took place in Lille at the beginning of June 2022.

- I was one of the four organizers of **the summer shcool on Lévy processes** which took place in Lille in the middle of July 2016.

- I was one of the four organizers of the **international congress « Meeting on self-similarity and related fields »** which took place in Le Touquet at the beginning of June 2011.

- I was one of the six organizers of the **Workshop « Filtering, MCMC, ABC »** which took place in Lille at the end of March 2011.

- I was one of the seven organizers of **the international congress « Les journées de Probabilités 2008 » (The days of Probability 2008)** which took place in Lille at

[5]This is a monthly seminar which is common to all the members of the « Laboratoire Paul Painlevé ».
[6]Notice that the name of this research unit has now become « Equipe Statistique et Probabilités ».

the beginning of September 2008.

- I was one of the four organizers of the **international congress « Stochastic Processes and Random Fractals »** which took place in Lille at the end of March 2006.

- I participated in **the organization of the three international congresses: « Fractals and Engineering 1999 », « Les journées de Probabilités 2003 » (The days of Probability 2003) and « Fractals and Engineering 2005 »**.

MAIN TEACHING ACTIVITIES

- I teach **Probability and Statistics** at all levels; most of my teaching activities takes place at the « IAE de Lille » (the department of management sciences at my university).

- During four years (from 2005-2006 to 2008-2009), I gave a course on **Functional Analysis** in the Master 2 Degree in Applied Mathematics at my university.

- During four years (from 2010-2011 to 2013-2014), I gave a course on **Stochastic Processes** in the Master 2 Degree in Applied Mathematics at my university.

- During three years (2015-2016 to 2017-2018), I gave a course on **Itô's Stochastic Integrals** in the Master 2 Degree in Applied Mathematics at my university.

- During two years (2020-2021 and 2021-2022), I gave a course on **Stochastic Calculus and Diffusions Models** in the Master 2 Degree in Mathematics at my university.

- I gave an introductory course on **Wavelets and Fractional Processes** at National Taiwan University (Taiwan, December 2009), and also at the Faculty of Sciences of Monastir (Tunisia, January 2011).

- I gave an introductory course on **Fractional and Multifractional Processes** at Wuhan University (China, September 2010), and also at the Faculty of Sciences of Monastir (Tunisia, October 2010).

RESPONSIBILITIES RELATED TO RECRUITMENT

- In 2020, **I was a member of a selection committee « Comité de Sélection » for recruiting a professor « Professeurs des Universités deuxième classe » in Applied Mathematics** at the University Paris-Est Créteil.

- In 2009, 2010 and 2016, **I was a member of selection committees « Comités**

de Sélection » for recruiting assistant professors « Maîtres de Conférences » in Applied Mathematics at the University Paris-Est Créteil.

- In 2009, 2011, 2015 and 2018, **I was a member of selection committees « Comités de Sélection » for recruiting assistant professors « Maîtres de Conférences » in Applied Mathematics** at the University Lille 1 and the University of Lille.

- In 2009 and 2011, **I was a member of selection committees « Comités de Sélection » for recruiting professors « Professeurs des Universités deuxième classe » in Applied Mathematics** at the University Lille 1.

- In 2007 and 2008, **I was a member of the selection committee « Commission de Spécialistes » for recruiting professors « Professeurs des Universités deuxième classe » , assistant professors « Maîtres de Conférences » and « ATER » in Management Sciences** at the University Lille 1.

- In 2003 and 2004, **I was a member of the selection committee « Commission de Spécialistes » for recruiting assistant professors « Maîtres de Conférences » and « ATER » in Mathematics** at the University of Angers.

OTHER RESPONSIBILITIES AND ACTIVITIES

- From February 2019 to December 2025, **I am responsible of the team Probability and Statistics of the « UMR CNRS 8524, Laboratoire Paul Painlevé »** (the research unit in Mathematics at the University of Lille). This responsibility became completely official on the beginning of January 2020. I shared it with my colleague Myriam Fradon in the period between February 2019 and October 2020. I share it with my two colleagues Mylène Maïda and Laurence Marsalle in the period between December 2023 and December 2025. I was the sole responsible of the team Probability and Statistics in the period between between November 2020 and November 2023.

- **I am a partner investigator of the Australian Research Council's Discovery three-year Project number DP220101680**, which started in by the beginning of the year 2022.

- From September 2015 to August 2018, the **« Licence Mathématiques Appliquées aux Sciences Sociales (MASS) » (Licenciate (bachelor degree) in Applied Mathematics and Social Sciences)** at the University of Lille was under my responsability. Also, I was the director of studies and the president of the jury of its third year.

- I am the responsible for the site of « Lille - Côte d'Opale » of the **« GDR Analyse**

Multifractale et Autosimilarité » (research group in Multifractal Analysis and Self-Similarity) (`http://gdramf.math.cnrs.fr`).

- I was the coordinator of the task « Stochastic Processes and Statistical Estimation » of the **« ANR AMATIS » (the four-year research projet on Multifractal Analysis and Applications to Image and Signal Processing which started in December 2011)**.

- From the beginning of January 2006 to the end of December 2009, I was **a member of the scientific committee** of the « Laboratoire Paul Painlevé » .