Marie Kratz

Professor, Department Information Systems, Decision Sciences and Statistics (IDS)

Contact

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Education

Main

Doctorate in Applied Mathematics, UPMC (Paris 6), done to a great extent at the *Center for Stochastic Processes*, UNC, Chapel Hill, USA

Habilitation à Diriger des Recherches, Commission des Thèses en Mathématiques des Universités Parisiennes & Université Paris I

Title:

Fellow (Actuaire Agrégée) of Institut des Actuaires

Additional

Master in Actuarial Science: SAFIR-SAF, Univ. Lyon 1 (Fall 2011-2013)

Global colloquium on participant-centered learning, Harvard Business School (Executive Education) (July 25- Aug.04, 2010; March14-18, 2011)

Ecole d'été de Probabilités de Saint-Flour (R. Adler & A. Etheridge lectures) (July 5-17, 2009)

From classical to Modern Probability, CIMPA & CMM summer school, Universidad de la Frontera, Temuco, Chile (Jan. 2001)

Summer Internships Program in Probability and Stochastic Processes, University of Wisconsin, Madison, U.S.A. (J. Kuelbs and T. Kurtz) (July 1999)

Biography

ESSEC Full Professor, from Oct. 2011

Director of CREAR - **C**enter of **R**esearch in **E**cono-finance and **A**ctuarial Science on **R**isk - (see http://crear.essec.edu), from Jan. 2013

Fellow of the "Institut des Actuaires" (IA 2013; qualification 2015; certification 2015; fellow 2016)

ESSEC Associate Professor, Oct. 2006 - Sept. 2011

Maître de Conférences at the University René Descartes Paris V (UFR Mathématiques & Informatique) until Oct. 2006

Delegation C.N.R.S. (SAMOS-MATISSE, UMR 8595, 1999-2000)

Post-doctorat/delegation with S. Resnick (Fall sem. 1993, 94, 95), Cornell University (O.R.I.E.), Ithaca, N.Y., USA

Research Areas

Areas

My research revolves around several themes that might be classified into two domains, both related to Extreme Value Theory (EVT):

(i) the study of random excursion sets with applications in various fields

(ii) the analysis of extreme risk and quantitative risk management (QRM)

Keywords: Quantitative Risk Analysis; Extreme Risks; Extreme Value Theory; Gaussian processes (non linear functionals); Stochastic Geometry; Point Processes; Time Series; Dynamical Systems

Sectors

(Applied) Probability; Mathematical Statistics; Actuarial Mathematics; Risk Management

On-going Projects

On-going papers presented at International Conferences:

M. Bräutigam, M. Dacorogna, M. Kratz: Procyclicality of Empirical Measurements of Risk in Financial Markets

Projects and Research Programs

- Scientific Coordinator of the "Risk Analysis and Modeling" direction, in the European Project RARE - Risk Analysis, Ruin and Extremes - FP7-PEOPLE-2012-IRSES - Marie Curie Actions, which aims to strengthen research partnerships through staff exchanges and networking activities between European research organizations and research organizations from other countries. (12 partners) (Oct 12 - Oct16)

- Director of the Research Program with SWISS LIFE on : *Consequences of the population ageing on the insurances loss. Impacts on the automobile prevention* (Dec 11 - Dec 14)

Publications

Academic Publications

Articles

"Multinomial VaR Backtests: A simple implicit approach to backtesting expected shortfall" (M. Kratz, Y. Lok, A. Mcneil), *Journal of Banking and Finance*, Issue C

"Discussion of 'Elicitability and backtesting: Perspectives for banking regulation'" (M. Kratz), *The Annals of Applied Statistics*, Issue 4

"Validation of aggregated risk models" (M. Kratz, M. Dacorogna, L. El Bahtouri), *Annals of Actuarial Science*, Dec 2017, Vol. 12, Issue 2, p. 433-454

"Central Limit Theorem for Lipschitz–Killing Curvatures of Excursion Sets of Gaussian Random Fields" (M. Kratz, S. Vadlamani), *Journal of Theoretical Probability*, Apr 2017, Vol. 26, Issue 3, p. 1-30

"On the order of functions at infinity" (M. Cadena, M. Kratz, E. Omey), *Journal of Mathematical Analysis and Applications*, Issue 1

"On the capacity functional of excursion sets of Gaussian random fields on R^2" (M. Kratz, W. Nagel), *Advances in Applied Probability*, Issue 48

"New results for tails of probability distributions according to their asymptotic decay" (M. Cadena, M. Kratz), *Statistics and Probability Letters*, Issue 109

"What is the best risk measure in practice? A comparison of standard risk measures" (S. Emmer, M. Kratz, D. Tasche), *Journal of Risk (The)*, Issue 18

"An Extreme Value Theory approach for the early detection of time clusters. A simulation-based assessment and an illustration to the surveillance of Salmonella." (A. Guillou, M. Kratz, Y. Le Strat), *Statistics in Medicine*, Issue 33

"Normex, a new method for evaluating the distribution of aggregated heavy tailed risks. Application to risk measures." (M. Kratz,), *Extremes*, Issue 17

"The impact of systemic risk on the diversification benefits of a risk portfolio" (M. Busse, M. Dacorogna, M. Kratz), *Risks*, Jul 2014, Vol. 2, Issue 3, p. 260-276

"Modelling macroeconomic effects and expert judgements in operational risk : a Bayesian approach" (H. Capa Santos, M. Kratz, F. Mosquera M), *Journal of Operational Risk*, Dec 2012, Vol. 7, Issue Winter 2012-2013, p. 3-23

"Alarm System for Insurance Companies: A Strategy for Capital Allocation" (S. Das, M. Kratz,), *Insurance Mathematics and Economics*, Mar 2012, Vol. online, Issue 51, p. 53-65

"How fast can the chord-length distribution decay?" (Y. Demichel, A. Estrade, M. Kratz, G. Samorodnitsky), *Advances in Applied Probability*, Issue 2

"Chord-length distribution functions and Rice formulae. Application to random media" (A. Estrade, I. Iribarren, M. Kratz), *Extremes*, Issue July

"Level curves crossings and applications for Gaussian models." (M. Kratz, J. Leon), *Extremes*, Sep 2009, Vol. 13, Issue online first

"Level crossings and other level functionals of stationary Gaussian processes" (M. Kratz), *Probability Surveys*, Dec 2006, Vol. 3, p. 230-288

"On the second moment of the number of crossings by a stationary Gaussian process" (M. Kratz, J. Leon), *Annals of Probability*, Jul 2006, Vol. 34, Issue 4, p. 1601-1607

"On a representation of Gibbs measure for R.E.M." (M. Kratz, P. Picco), *Annals of Applied Probability*, May 2004, Vol. 14, Issue 2, p. 651-677

"Central Limit Theorems for Level Functionals of Stationary Gaussian Processes and Fields" (M. Kratz, J. Leon), *Journal of theoretical probability*, Jul 2001, Vol. 14, Issue 3, p. 639-672

"Central limit theorems for the number of maxima and some estimator of the second spectral moment of a stationary Gaussian process. Applications in hydroscience" (M. Kratz, J. Leon), *Extremes*, Mar 2000, Vol. 3, Issue 1, p. 57-86

"On the rate of convergence for extremes of mean square differentiable stationary normal processes" (M. Kratz, H. Rootzén), *Journal of Applied Probability*, Dec 1997, Vol. 34, Issue 4, p. 908-923

"Hermite polynomial expansion for non-smooth functionals of stationary Gaussian processes: crossings and extremes" (M. Kratz, J. Leon), *Stochastic Processes and their Applications*, Mar 1997, Vol. 66, Issue 2, p. 237-252

"The Q-Q estimator and heavy tails" (M. Kratz, S. Resnick), *Stochastic Models*, Apr 1996, Vol. 12, Issue 4, p. 699-724

"Parameter estimation for moving averages with positive innovations" (M. Kratz, S. Resnick, P. Feigin), *Ann. Applied Probab.*, Jan 1996, Vol. 6, p.

1157-1190

"Rate of Poisson approximation of the number of exceedances of nonstationary normal sequences" (M. Kratz, J. Hüsler), *Stochastic Processes and their Applications*, May 1995, Vol. 55, p. 301-313

"Approximation Poissonnienne relative du processus empirique" (M. Kratz), *C.R.A.S.*, May 1993, Vol. 316, série I, p. 1221-1224

Book Chapters

On the Estimation of the Distribution of Aggregated Heavy-Tailed Risks: Application to Risk Measures. In: *Extreme events in finance. A Handbook of Extreme Value Theory and its Applications*. New Jersey (USA) : WILEY, François Longin. 2016, p. 239-282

Working Papers

"Predicting Risk with Risk Measures: An Empirical Study" (M. Bräutigam, M. Dacorogna, M. Kratz). Essec Research Center, DR-1803 Feb 18.

"Diversification benefits under multivariate second order regular variation" (B. Das, M. Kratz). Essec Research Center, DR-1706 Apr 17.

"A self-calibrating method for heavy tailed data modeling. Application in neuroscience and finance" (N. Debbabi, M. Kratz, M. Mboup). Essec Research Center, DR-1619 Dec 16. (preprint arXiv:1612.03974v1 and http://ssrn.com/abstract=2898731)

"Risk Measure Estimates in Quiet and Turbulent Times: An Empirical Study" (R. Chotard, M. Dacorogna, M. Kratz). Essec Research Center, DR-1618 Nov 16. (http://ssrn.com/abstract=2898708)

"Multinomial VaR Backtests: A simple implicit approach to backtesting expected shortfall" (M. Kratz, Y. Lok, A. Mcneil). Essec Research Center, DR-1617 Nov 16. (preprint arXiv:1611.04851v1 and http://ssrn.com/abstract=2898688)

"CLT for Lipschitz-Killing Curvatures of Excursion Sets of Gaussian Random Fields" (M. Kratz, S. Vadlamani). Essec Research Center, DR-1615 Aug 16. (https://ssrn.com/abstract=2844693)

"Risk Neutral Versus Real-World Distribution of Publicly Listed Bank Corporations" (M. Kratz). Essec Research Center, DR-1614 Jul 16. (https://ssrn.com/abstract=2844691)

"Explicit Diversification Benefit for Dependent Risks" (M. Dacorogna, L. Elbahtouri, M. Kratz). Essec Research Center, DR-1522 Dec 15. (https://ssrn.com/abstract=2765403)

"Living in a stochastic world and managing complex risks." (M. Kratz). Essec Research Center, DR-1517 Oct 15. (https://ssrn.com/abstract=2668468)

"An Extension of the Class of Regularly Varying Functions" (M. Kratz, M. Cadena). Essec Research Center, DR-1417 Dec 14. (https://ssrn.com/abstract=2541583)

"An extension of the class of regularly varying functions" (M. Cadena, M. Kratz,). Essec Research Center, DR-1417 Dec 14.

"On the Capacity Functional of Excursion Sets of Gaussian Random Fields on R^2" (M. Kratz, W. Nagel). Essec Research Center, DR-1416 Nov 14. (https://ssrn.com/abstract=2541528)

"What Is the Best Risk Measure in Practice? A Comparison of Standard Measures" (S. Emmer, M. Kratz, D. Tasche). Essec Research Center, DR-1322 Dec 13. (https://ssrn.com/abstract=2370378)

"The Impact of Systemic Risk on the Diversification Benefits of a Risk Portfolio" (M. Busse, M. Dacorogna, M. Kratz). Essec Research Center, DR-1321 Dec 13. (https://ssrn.com/abstract=2364353)

"There is a VaR Beyond Usual Approximations" (M. Kratz). Essec Research Center, DR-1317 Nov 13. (https://ssrn.com/abstract=2356808)

"Detecting and Forecasting Large Deviations and Bubbles in a Near-Explosive Random Coefficient Model" (A. Banerjee, G. Chevillon, M. Kratz). Essec Research Center, DR-1314 Oct 13. (https://ssrn.com/abstract=2322360)

"Does risk diversification always work? The answer through simple modelling" (with M. Busse, M. Dacorogna). SCOR , 24 May 13.

"Modelling Macroeconomic Effects and Expert Judgements in Operational Risk: A Bayesian Approach" (H. Capa Santos, M. Kratz, F. Mosquera Munoz). Essec Research Center, DR-1206 Mar 12. (https://ssrn.com/abstract=2331993)

"On Devising Various Alarm Systems for Insurance Companies" (M. Kratz). Essec Research Center, DR-10008 Dec 10. (https://ssrn.com/abstract=2122423)

"Some contributions in probability and statistics of extremes" Université Paris 1 , HAL : tel-00239329 Nov 05.

"Chaos expansions and level crossings" Univ. Paris 1, Samos 127 Sep 00.

"Statistics of tails of distributions and Poisson approximation" UPMC Paris 6, 93 Mar 93. (Doctorate thesis in Applied Mathematics - UPMC (Paris 6))

Other Publications

Articles published in Conference Proceedings

"A New Unsupervised Threshold Determination For Hybrid Models.", With N. Debbabi. In : *Acoustics, Speech and Signal Processing*, 2014 IEEE. : IEEE, 2014, p. 3440-3444

"Combining algebraic approach with extreme value theory for spike detection", With N. Debabbi, M. Mboup, S. El Asmi. In : *Proceedings of EUSIPCO 2012*, 20th European Signal Processing Conference. : IEEE Conference Publications Program, 2012, p. 1836-1840

"Fixed points of the Abe formulation of Stochastic Hopfield Networks", With M. Atencia, G. Joya. In : *LNCS 4668*, ICANN . Porto (Portugal) : Springer-Verlag, 2007, p. 599-608

"Stochastic analysis of the Abe formulation of Hopfield networks", With M. Atencia, G. Joya. In : *Proceedings ESANN*, ESANN (13th European Symposium on Artificial Neural Networks). Bruges (Belgium) : *, 2005, p. 55-60

"On the convergence of the number of exceedances of nonstationary normal sequences", With J. Hüsler. In : *Journal of Research of the NIST (National Institute of Standards and Technology), vol 99*, Extreme Value Theory and Applications. Gaithersburg, Maryland (USA) : NIST, 1994, p. 539-542

Press Articles

"Changing times require new tools for risk management". *Asian Insurance Review*, 05 Dec 2016, p. 98-99

"L'actuariat, des activités et compétences en pleine évolution". *Grandes Ecoles Universités, Le Magazine - HS Spécial Finance & Marketing*, 01 Nov 2016, p. 8-8

"Managing risk is about raising society's resilience". *The Business Times*, 17 Dec 2015

Journal Preface / Introduction

Preface to *Annals of Actuarial Science*, 2018, Issue 2 - 'RARE' special issue, p. 209-2010 (RARE (Risk Analysis, Ruin theory, Extremes) special issue)

Teaching

Teaching at ESSEC

Financial Mathematics : Probability in finance (Ms ESSEC Grande Ecole)

Gestion des risques (ISUP Univ. Paris 6 - CS3 - Actuarial track) (from 2011-12)

Extreme Value Theory (ISUP Univ. Paris 6 - CS3 - Actuarial track) (from 2016-17)

Séries temporelles (ISUP Univ. Paris 6 - CS2) (2006-07 to 2010-11)

Forecasting (Ph.D. OMS)

Probability and Stochastic Processes (MS FEAsia & Ph.D)

Statistics (MS FEAsia)

Quantitative Risk Management (QRM) (Ms ESSEC Grande Ecole)

QRM & Extreme values (MS FEAsia Singapore)

Research UE on QRM

Statistics in Business (Bachelor) (from 2007 to 2009) (coordinator from 2008 to 2011)

Other Teaching Activities

- CFA France Research Workshop, '*A self-Calibrating Method for Heavy Tailed Data Modeling*', Paris, Sep. 28, 2017

- Singapore Actuarial Society Forum on '*Overview of Copulas for Actuaries in Management*', Singapore, Feb. 23, 2017

- 1/2 day workshop on '*EVT and its Application to finance and insurance*', ETH Risk Center, Zurich, Switzerland, March 24, 2017

- Mini-workshop on '*Modeling and Backtesting Heavy Tailed Data*', Durham Business School, UK, Jan.16, 2017

- '*An implicit backtest for Expected Shortfall via a simple multinomial approach*', Bank of International Settlements, Basel, Switzerland, Nov.2, 2016

- '*A self-Calibrating Method for Heavy Tailed Data Modeling*', SwissRe, Zurich, Switzerland, Sept. 13, 2016

- Two days executive seminar on *Quantitative Risk Management*, NISM (National Institute of Securities Markets), Mumbai, India, Feb.20-21, 2016

- 'An Introduction to Quantitative Risk Management' - course given at the Summer School on Risk Management in Finance and Insurance, National Economics University, Hanoi, Vietnam, July 29 - August 2, 2013

Other Activities

Scientific Activities

Editorial Board Membership

Annals of Actuarial Science, Cambridge University Press

Conference Presentations

"On the regularity of time occupation functionals for Gaussian processes", Conference on 'Rough Paths Theory and Malliavin Calculus', Rencontres Mathématiques de Rouen 2018, Rouen, France, 21 Jun 2018

"Level Functionals for Gaussian Fields", Random waves in Oxford, Oxford Univ. & ERC, Oxford, UK, 20 Jun 2018

"A Self-Calibrating Method for Heavy Tailed Data Modeling", (with N. Debbabi, M. Mboup). ESCO 2018, ESCO, Pilsen, Czech Republic, 07 Jun 2018

"Level Crossings and Applications", Can Stochastic Geometry handle Dynamics of Risk Management?, Lund University, Lund, Sweden, 19 Apr 2018

"Managing Complex Risks in a Changing Environment", 15th ART of CROs, The Geneva Association, Zurich, 11 Apr 2018

"An implicit backtest for Expected Shortfall via a simple multinomial approach", (with Y. Lok, A. Mcneil). IASSL 3rd International Conference: Statistics for Good Governance, Univ. of Maryland Baltimore Country (USA), Missouri Univ. Science and Technology, Rolla (USA), Univ. of Hong Kong (Hong Kong), Univ. of Moratuwa (Sri Lanka), Univ. of Colombo (Sri Lanka), Wayamba University of Sri Lanka, Colombo, Sri Lanka, 29 Dec 2017

"A Self-Calibrating Method for Heavy Tailed Data Modeling. Applications in Finance and Insurance", (with N. Debbabi, M. Mboup). CMStat 2017, CFEnetwork and CMStatistics, Birbeck University of London, London School of Hygiene & Tropical Medicine, London, UK, 17 Dec 2017

"Analyzing and Managing the New Risk Environment in Insurance Industry: perspectives and challenges for academics", (with M. Callan). MATRIX workshop: "Mathematics of Risk", ARC Centre of Excellence for Mathematical & Statistical Frontiers (ACEMS), University of Technology Sydney, and the School of Mathematical Sciences, Monash University, Creswick, Canada, 29 Nov 2017

"On Risk Concentration", MATRIX workshop: "Mathematics of Risk", ARC Centre of Excellence for Mathematical & Statistical Frontiers (ACEMS), University of Technology Sydney, and the School of Mathematical Sciences, Monash University, Creswick, Australia, 27 Nov 2017

"Introduction to Extreme Value Theory - Applications to Risk Analysis", MATRIX workshop: "Mathematics of Risk", ARC Centre of Excellence for Mathematical & Statistical Frontiers (ACEMS), University of Technology Sydney, and the School of Mathematical Sciences, Monash University, Creswick, Australia, 20 Nov 2017

"Panel discussion on “Risk Management and Regulatory Practice”", Workshop on 'Risk Measurement and Regulatory Issues in Business', Centre de Recherches Mathématiques (CRM) - Université de Montréal, Montreal, Canada, 13 Sep 2017

"A Procyclicality of Empirical Measurements of Risk in Financial Markets", (with M. Bräutigam, M. Dacorogna). Workshop on 'Risk Measurement and Regulatory Issues in Business', Centre de Recherches Mathématiques (CRM) - Université de Montréal, Montreal, Canada, 11 Sep 2017

"Limit Theorems for Functionals of Excursion Sets of Gaussian Random Fields", (with S. Vadlamani). 39th SPA conference, Bernoulli Society for Mathematical Statistics and Probability, and various universities of Moscow, Moscow, Russia, 28 Jul 2017

"An EVT Approach for the Early Detection of Time Clusters. Application in Health Surveillance", (with A. Guillou, Y. Le Strat). Probability: from East to West, Monash University, Prato, Italy, 20 Jul 2017

"A Self-Calibrating Method for Heavy Tailed Data Modeling. Applications in Finance and Insurance", (with N. Debbabi, M. Mboup). IRFRC annual conference, NTU, Singapore, Singapore, 30 Jun 2017

"Procyclicality of Empirical Measurements of Risk in Financial Markets", (with M. Bräutigam, M. Dacorogna). EVA2017, TU Delft, Delft, Netherlands, 28 Jun 2017

"EVT and its Application to finance and insurance", ETH Risk Center Workshops, ETH, Zurich, Switzerland, 24 Mar 2017

"Overview of Copulas for Actuaries in Management", SAS Forum , Singapore Actuarial Society, Singapore, Singapore, 23 Feb 2017

"Risk Measure Estimates in Quiet and Turbulent Times : an Empirical Study", 10th International Conference on Computational and Financial Econometrics, CFEnetwork, University of Seville, Spain, Queen Mary University of London and Birkbeck University of London, UK, Sevilla, Spain, 10 Dec 2016

"CLT for Lipschitz-Killing curvatures of excursion sets of Gaussian fields", (with S. Vadlamani). 6th Ritsumeikan-Monash Symposium on Probability and Related Fields, Ritsumeikan University, Biwako-Kusatsu, Japan, 12 Nov 2016

"Validation of risk models", 3rd ERM-SAS conference, Singapore Actuarial Society, Singapore, Singapore, 27 Sep 2016

"Risk Concentration under 2nd order MRV", (with B. Das). Concluding international RARE Conference, ESSEC, La Baule, France, 04 Jul 2016

"An implicit backtest for ES via a simple multinomial approach", (with Y. Lok, A. Mcneil). 5th Iberian Congress of Actuaries, ISEG Lisbon, Lisbon, Portugal, 06 Jun 2016

"A multinomial test to discriminate between models", (with Y. Lok, A. Mcneil). ASTIN Colloquium, ISEG Lisbon, Lisbon, Portugal, 02 Jun 2016

"CLT for Lipschitz-Killing curvatures of excursion sets of Gaussian fields", (with S. Vadlamani,). Monash Probability Conference in Honor of Robert Liptser, Monash University, Prato, Italy, 28 Apr 2016

"Validation of risk models", (with M. Dacorogna). IFoA Asia conference 2016, Institute and Faculty of Actuaries (IFoA), Kuala Lumpur, Malaysia, 03 Mar 2016

"On the local behavior of the extreme quantiles of the sum of heavy tailed distributed r.v.", World Statistics Congress, ISI, Rio de Janeiro, Brazil, 30 Jul 2015

"What is the best risk measure in practice?", SEM annual conference, OECD, Paris, France, 24 Jul 2015

"Standard risk measures: a statistical debate", IMS conference, Kunming, China, 02 Jul 2015

"Asymptotics of some geometric features of excursion sets of Gaussian random fields", (with S. Vadlamani). EVA2015 , Ann Arbor, USA, 17 Jun 2015

"On functionals of excursion sets of Gaussian random fields on R^2.", (with W. Nagel). 5th Monash-Ritsumeikan Symposium, Monash University, Melbourne, Australia, 25 Mar 2015

"Risk aggregation of heavy-tailed risks", PARTY 2015 (Perspectives on Actuarial Risks in Talks of Young researchers), Liverpool, UK, 13 Jan 2015

"On the aggregation of heavy-tailed risks", Extremes in Finance, ESSEC, Royaumont Abbey, France, 17 Dec 2014

"Setting the risk appetite in presence of systemic risk", ERM-SAS conference, SAS, Singapore, Singapore, 13 Nov 2014

"On a generalization of some Karamata and standard EVT characterizations", (with M. Cadena). 37th Stochastic Processes and Applications conference, Univ. Econ., Buenos Aires, Argentina, 31 Jul 2014

"Pot-pourri on RARE topics", RARE Workshop, Nankai University, China, 14 Jul 2014

"Small Data", 13ème Congrès des Actuaires, Institut des Actuaires, Paris, France, 20 Jun 2014

"On a generalization of some Karamata and standard EVT characterizations", 7th International Workshop on Applied Probability (IWAP 2014), Antalya, Turkey, 18 Jun 2014

"The impact of systemic risk on the diversification benefits of a risk portfolio", (with M. Busse, M. Dacorogna). 4th Monash-Ritsumeikan Symposium on Probability and Related fields - RARE workshop, Ritsumeikan University, Kyoto, Japan, 26 Feb 2014

"Normex, a new method for evaluating the VaR of aggregated heavy tailed risks", Extreme Events and Uncertainty in Insurance and Finance, SCOR & IDEI, Toulouse School of Economics, Paris, France, 10 Jan 2014

"Does risk diversification always work? The answer through simple modelling", (with M. Busse, M. Dacorogna). European Network for Business and Industrial Statistics - ENBIS13, Hacettepe Univ., Ankara, Turkey, 17 Sep 2013

"A shifted CLT : an alternative solution to correctly estimate in a Gaussian realm the VaR in presence of heavy tails", Extremes in Vimeriro -EVT13, CEAUL (Centro de Estatistica e Aplicaçoes da universidad de Lisboa) & SPE (Sociedad Portuguesa de Estatistica) , Vimeiro, Portugal, 09 Sep 2013

"Capacity functionals of excursion sets", (with W. Nagel). Extreme Value Analysis 13, Fundan Management School, Shanghai, 11 Jul 2013

"How to best approximate the distribution of aggregated heavy tailed risks?", IRFRS Conference , Nanyang Business School, Singapore, 27 Jun 2013

"There is a VaR beyond usual approximations", Workshop on Heavy-tailed Distributions and Extreme Value Theory, Indian Statistical Institute (ISI), Kolkata, India, 15 Jan 2013

"Tail distribution of functionals of random excursion sets", (with W. Nagel). Stereology, Spatial Statistics and Stochastic Geometry (S4G), Charles University Prague, Prague, Czech Republic, 28 Jun 2012

"Tail distribution of functionals of random excursion sets", (with W. Nagel). International Workshop on Applied Probability (IWAP), Jerusalem, Israël, 13 Jun 2012

"Funcionales de nivel de procesos gaussianos y aplicaciones.", Conferencia Leon: Analisis estadistica y probabilidades, Caracas, Venezuela, 25 Nov 2011

"On a modelization of random porous media.", Ristumeikan and Monash Symposium, Shiga (Kyoto), Japan, 12 Sep 2010

"Operational Risk Measure in Bayesian context. Application in Insurance.", 34th Conference on Stochastic Processes and their Applications, Osaka, Japan, 08 Sep 2010

"EVT in discrete case. Application to disease surveillance. ", Prague Stochastics, Prague, Czechoslovakia, 02 Sep 2010

"On the decay of chord-lengths", Stochastic Processes and their Applications, Berlin, Germany, 30 Jul 2009

"A brief review on EVT basics and operational risk measures", European Workshop on Risk Analysis and EVT, ESSEC, La Défense Paris, France, 26 Jan 2009

"Franchissement de courbe de niveau, formules de Rice et extremum", MAS, SMAI, Rennes, France, 28 Aug 2008

"On efficiency and alarm system in reinsurance contracts", (with S. Das). 7th World Congress in Probability and Statistics, IMS and Bernoulli Society, Singapore, Singapore, 14 Jul 2008

"Fixed points of the Abe formulation of Stochastic Hopfield Networks", (with M. Atencia, G. Joya). 17th ICANN, Porto, Portugal, 10 Sep 2007

"Chord-distribution functions and Rice formulae. Application to random media.", (with A. Estrade, I. Iribarren). 5th Conference on Extreme Value Analysis, Bern, Switzerland, 27 Jul 2007

"Funciones de distribucion de cuerdas en medios porosos.", (with A. Estrade, I. Iribarren). Rencontres France-Espagne-Venezuela de probabilité et statistique mathématique, Choroni, Venezuela, 02 Nov 2006

"Curve crossings and specular points, d'après Longuet-Higgins.", (with J. Leon). 31th Conference on Stochastic Processes and their Applications, Paris, France, 18 Jul 2006

"On level functionals of Gaussian fields", 2nd Intern. Conf. of Applied Mathematics, Plovdiv, Bulgaria, 15 Aug 2005

"Stochastic analysis of the Abe formulation of Hopfield", (with M. Atencia, G. Joya). European Symposium on Artificial Neural Networks, Bruges, Belgium, 26 Apr 2005

"Estadisticas de valores extremos", IX Encuentro de Matem\'atica y sus Aplicaciones y IV Seminario de Estad\'istica Aplicada, Quito, Ecuador, 22 Jul 2004

- **Organizer of a Working Group on Risk Analysis and Management** - ESSEC La Défense, since Oct. 2009

Meetings: twice a month (seminars and/or discussions on projects)

Since March 2012, it has been acknowledged by the French Institute of Actuaries as part of its continuous education program

see http://isds-department.essec.edu/research/working-group-on-risk

and, since 2013, http://crear.essec.edu/research/working-group-on-risk

(Co) Organizer of conferences:

- 'Cyber risks - Threats and Opportunities for the Asia Pacific Insurance Industry', July 26-27, 2018, 4th SAS ERM - ESSEC CREAR Conference, Singapore

- 'Lois Scientifiques et Modèles Mathématiques: de la physique à l'actuariat', Dec. 1, 2016, Colloque SCOR-IA, Paris

- 'Financial risk: Black Swan or Opportunities?' October 20, 2016, ESSEC Cergy-Pontoise

- Concluding International 'RARE' Conference on Risk Analysis, Ruin theory, Extremes - July 3-8, 2016, La Baule (CREAR, with the support of Swiss Re, Institut des Actuaires, SCOR science foundation, Bank of England, AMIES-IA, IFoA, BFA-SFdS): crear.essec.edu/rare-conference

- International Round Table on *New IFRS rules : Actuaries meet Accountants*, June 10, 2015, Paris La Défense (CREAR, with the support of Labex MME-DII, Institut des Actuaires & BFA-SFdS)

- Mini-workshop "Small data " (CREAR & BFA-SFdS), 13ème Congrès des Actuaires, Paris, June 20, 2014

- ESSEC CREAR - SWISS LIFE conference on *Risk, Insurance and Longevity*, ESSEC La Défense, November 19, 2012

http://risk-insurance-longevity-event.essec.edu

- BFA Group of SFdS & ESSEC Working Group on Risk conference on Financial Regulation - Paris, April 09, 2010

http://isds-department.essec.edu/research/working-group-on-risk/financial-regulation

- European workshop on EVT & Finance - Paris La défense, January 26, 2009

http://www.essec.edu/sites/EVTfinance09/

- Workshop on Models and Images for Porous Media - Paris, January 12-16, 2009

http://mipomodim.math-info.univ-paris5.fr/

Organizer of **invited** or **contrinuted sessions** at international conferences

- 'RARE' Invited Session, EVA2015, Ann Arbor, USA, June 15-19, 2015

- 'RARE' Contributed Session, 37th Stochastic Processes and Applications, Buenos Aires, Argentina, July 28-Aug.1, 2014

- 'RARE' Invited Session, 7th International Workshop on Applied Probability (IWAP), Antalya, Turkey, June 16-19, 2014

Affiliations and Academic Responsibilities

Academic Responsibilities:

- Director of CREAR - **C**enter of **R**esearch in **E**cono-finance and **A**ctuarial sciences on **R**isk ; see http://crear.essec.edu

- Organizer of a working group with academics and professionals on (quantitative) risk analysis

- Director of the research program ESSEC - SWISS LIFE "Consequences of the population ageing on the insurances loss. Impacts on the automobile prevention" Dec 2011 Dec 2013

- Scientific Coordinator of the "Risk Analysis and Modeling" direction, in the European Project 'RARE' - Risk Analysis, Ruin and Extremes - FP7-PEOPLE-2012-IRSES - Marie Curie Actions, which aims to strengthen research partnerships through staff exchanges and networking activities between European research organizations and research organizations from other countries. (12 partners) (Oct 2012 - Nov. 2016)

- Director of the ESSEC-ISUP actuarial track (from Oct. 2012)

- Co-responsible of the ESSEC-ISUP actuarial track (Oct. 2008 - Oct. 2012)

- Co-organizer of the IDS department research seminar

Supervising Activities of:

- Doctoral Students:

M. Bräutigam (ESSEC CREAR & UPMC & LAbEx MME-DII): 'Quantitative Evaluation of Risks' (Start: Dec. 2016)

M. Cadena (UPMC-ESSEC-SWISS LIFE): `Contributions actuarielles et statistiques pour l'analyse de risques en assurance liés au vieillissement de la population, notamment en assurance automobile' - Defense: January 5, 2016 (UPMC Paris 6)

N. Debbabi (URCA): 'Approche algébrique et théorie des valeurs extrêmes pour la détection de ruptures: application aux signaux biomédicaux'; co-dir. with M. Mboup (Prof. URCA) and S. El Asmi (Prof. SUPCOM Tunis) - Defense: December 14, 2015 (SUPCOM Tunis)

- Master (or equivalent) Students:

Actuarial master thesis from ESSEC-actuarial track students

Research training at ESSEC and SWISSLIFE from May to November 12 for two Master students (ISFA, Lyon) (final training study to validate their diploma, one for a Research Master, the other for a Professional Master for the title of Actuary) on the "Consequences of the population ageing on the insurances loss. Impacts on the automobile prevention"

Research training at ESSEC from Feb. to May 2008 for an engineer student (ESSAI, Tunis) (final training study to validate his diploma) on "Extreme Value Theory for discrete random variables, with applications in Epidemiology and in Finance"

Paris Descartes Master students final professional trainings from 1997-98 to 2005-06 (MST2-ISASH, DESS MSB, Master 2 IMSV)

Affiliations:

BERNOULLI **S**OCIETY (for Mathematical Statistics and Probability- ISI section)

SFdS - Société Française de Statistique

Affiliated member to RiskLab, ETH Zurich

MAP5 (Applied Mathematics), UMR8145, Univ. Paris Descartes (until August 2017)

GDR 3477 (CNRS) - Géométrie Stochastique - see http://gdr-geostoch.math.cnrs.fr

Member of MIPOMODIM (Projet ANR blanc - NT05-1_42030) (2006-2009)

Consulting and Other Activities

Experts forum:

- Singapore Actuarial Society forum, '*Overview of Copulas for Actuaries in Management*', Singapore, Feb.23, 2017

- Research experts forum (invited panelist), fringe event to the IFoA Asia conference, Kuala Lumpur, Malaysia, March 2, 2016

- Round table of senior experts to discuss key issues and challenges that researchers of risk and practitioners from industries, perceive as significant over the next few years (Invited panelist by the IFoA), London, UK, April 27, 2015

- Experts Forum on *Risk Measures and Regulation in Insurance*, Swiss Re Learning Center (by invitation), Zurich, Switzerland, May 22-23, 2014

- Workshop on *Statistical Applications to Climate Extremes*, Zurich Development Center (by invitation), Zurich, Switzerland, Oct. 29-31, 2012

Other Activities

- Member of the *Banque, Finance, Assurance* - BFA group - SFdS (President until 2017)

- Member of the Advisory Board of QRFE, Durham Business School, UK (from 2015)

- Member of the Scientific Committee of the IRFRC Conference, NTU Singapore, from 2014

Professional Experience

Visiting Professor (from July 2017), Statistics Department, School of Economics and Management, Lund University, Sweden

Maître de Conférences (until Oct. 2006) in Mathematics, Université Paris Descartes (UFR Mathématiques & Informatique)

Internship at FINMA- Swiss Financial Market Supervisory Authority- Zürich, July-Dec 2012