Marie Kratz

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Contact

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Education

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

Post-doctorat (delegation), Cornell University (O.R.I.E.), Ithaca, N.Y., USA

Delegation C.N.R.S. (SAMOS-MATISSE, UMR 8595, 1999-00)

Habilitation à Diriger des Recherches (Commission des Habilitations des Universités Parisiennes and Université Paris I, 2005)

Biography

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

ESSEC Associate Professor, October 2006 - September 2011.

ESSEC Full Professor, from October 2011.

Research Areas

Applied Probability and Mathematical Statistics: Gaussian processes (non linear functionals of -), Extreme Value Theory, Risk analysis, Point processes, Time series, Dynamical systems.

On-going Projects

Papers under review:

- H. Capa, M. Kratz, F. Mosquera, Modelling macroeconomic effects and expert judgements in operational risk : a Bayesian approach.

- A. Guillou, M. Kratz, Y. Le Strat, An Extreme Value Theory approach for the early detection of time clusters with application to the surveillance of Salmonella (arXiv 1003.4466).

Reports:

- A.Borchani, Statistiques des valeurs extrêmes dans le cas de lois discrètes (rapport de stage) - (project partially supported by the ESSEC Research Center).

Organizer of the **ESSEC Working Group on Risk** (see http://isds-department.essec.edu/research/working-group-on-risk)

Member of **GDR 3477 on Stochastic Geometry** (see http://gdr-geostoch.math.cnrs.fr)

Publications

Academic Publications

Articles

"Alarm System for Insurance Companies: A Strategy for Capital Allocation"

(S. Das, M. Kratz,), *Insurance Mathematics and Economics*, Mar 2012, Vol. online, Issue March 2012

"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

Working Papers

"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.

"On Devising Various Alarm Systems for Insurance Companies" (M. Kratz). Essec Research Center, DR-10008 Dec 10.

Other Publications

Articles published in Conference Proceedings

"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

Teaching

Teaching at ESSEC

Financial Mathematics : Probability in finance (Ms ESSEC Grande Ecole) (english and french sections)

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

Forecasting (Ph.D. OMS)

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

Statistics (MS FEAsia)

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

QRM & EVT (MS FEAsia Singapore)

Other Activities

Scientific Activities

Conference Presentations

"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

- Co-Organizer of a conference on Financial Regulation - Paris, April 09, 2010

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

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

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

- Co-Organizer of: Workshop on Models and Images for Porous Media - Paris, January 12-16, 2009

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

Affiliations and Academic Responsibilities

Affiliations:

Bernoulli Society member

SFdS member

Vice president with A.Cohen of the group BFA (Bank, Finance, Insurance) of SFDS

Member of MAP5 (UMR CNRS 8145, Université Paris Descartes).

Academic Responabilities:

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

Co-organizer of the ISDS department research seminar.

Professional Experience

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