



Pierre Del Moral

INRIA Senior Research Scientist

The National Institute for Research in Computer Science and Control
& Institut de Mathématiques de Bordeaux

Head of INRIA Research Team ALEA (since 2009)

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• **Education :**

- Higher Degree of Research, (H.D.R.) in Math., U.P.S. Toulouse III (2002).
- Ph. D. Signal processing LAAS-CNRS & P. Sabatier Univ., Toulouse (1994).
- Master of Science, theory track, P. Sabatier Univ., Toulouse (1989). Pure Mathematics (Cohomology, Hyperbolic Geometry & Algebraic Geometry). (Grade: 1st class Honors).

• **Positions & Education :**

- *Research Director/Senior Research Scientist : DR2*
INRIA Bordeaux - Sud Ouest Center, since sept. 2007.
- *Head of the Probab. and Stat. team* of the Bordeaux Maths Inst. (2009)
- *University Professor* in probability and stochastic processes.
Lab. J.A. Dieudonné, Nice Sophia-Antipolis University (2004–2007).
- C.N.R.S Research Fellow, Section Physics et Math. (1995–2004).
- Invited Professor, **Purdue University**, West Lafayette, USA (2003).
- Invited Professor, **Princeton University** New-Jersey USA (2001).

• **Other professional experience :**

- Research engineer at DIGILOG-STERIA (1991-1992) & (1993-1995).
Research on Radar, Sonar, Gps signal processing and optimal control.
- *Lecturer in Mathematics.* Ecole Nationale Supérieure de l’Aéronautique et de l’Espace, Toulouse (1994-1995).

- **Research subjects :**

- Applied probability, stochastic algorithms and particle methods.
- Simulation & Monte Carlo methods in physics and engineering sciences.
- Branching and interacting particle systems, genealogical tree based models.
- Reinforced processes and self interacting Markov chains.
- Fluctuation analysis, large deviations and empirical processes.
- Feynman-Kac-Schroedinger semigroups and their application areas : nonlinear filtering, rare event analysis, molecular chemistry, biology.

- **Scientific publications:**

- 1 research monograph & 2 pedagogical books.
- 14 Contributions and chapters to books.
- 60 articles in pure and applied probability journals.
- 4 Applied sciences journals.
- 11 conference proceedings.
- 8 submitted technical reports.
- 9 Research and industrial contracts & 3 pedagogical lecture notes.

- **Ten Most significant articles and books in the last ten years:**

- Joint work with Fr. Caron, M. Pace, and G.N. Vo. **On the Stability and the Approximation of Branching Distribution Flows**, with Applications to Multiple Target Filtering, To appear in *Stochastic Analysis and Applications* (2010-2011).
- Joint work with E. Rio. **Concentration Inequalities for Mean Field Particle Models** To appear in *Annals of Applied Probability* (2010-2011).
- Joint work with A. Doucet, and S. S. Singh. **A Backward Particle Interpretation of Feynman-Kac Formulae**, vol 44, no. 5, pp. 947–976 *M2AN* (2010).
- Joint work with A. Doucet. **Interacting Markov chain Monte Carlo methods for solving nonlinear measure-valued equations**. *The Annals of Applied Probability*, Vol. 20, No. 2, 593-639 (2010).
- Joint work with F. Patras and S. Rubenthaler, **Coalescent tree based functional representations for some Feynman-Kac particle models**, *Ann. Appl. Probab.* Vol. 19, No. 2, 778–825 (2009).
- Joint work with A. Doucet, et A. Jasra : **Sequential Monte Carlo Samplers**. *Journal of the Royal Stat. Soc., Series B*, vol. 63, no. 3, pp. 411-436 (2006).
- Joint work with J. Garnier : **Genealogical Particle Analysis of Rare events**. *Annals of Applied Probability*, vol. 15, no. 4, pp. 2496–2534 (2005).
- Feynman-Kac formulae. **Genealogical and interacting particle approximations**. Springer-Verlag, New York, *Applied Probability Series* (2004).
- Joint work with M. Ledoux and L. Miclo : **Contraction properties of Markov kernels**. *Probab. Theory and Related Fields*, vol. 126, pp. 395-420, (2003).
- Joint work with L. Miclo : **On convergence of chains with time empirical self-interactions**. *Proc. Royal Soc. Lond. A.*, vol. 460, pp. 325–346 (2003).

- **Editorial Board**

- Chief editor : **ESAIM: Proceedings** since 2006.
- Associate editor : **Applied Mathematics and Optimization** since 2009.
- Associate editor *Revista de Matemàtica: Teoria y Aplicaciones*, since 2009.
- Associate editor : **Stoch. Proc. and their Applications** (2006-2009).
- Associate editor : **Stochastic Analysis and Applications** since 2001.
- Guest editor of M2AN with Nicolas Hadjiconstantinou (MIT University) for a 2010 special Volume on Probabilistic Methods.

- **Selection Committees and Research Management**

- Scientific expert for the PES research grant selection committee of the French Ministry of Research in 2010, section CNU 25 and 26.
- Member of the working group *Information, communication, matériaux-nanotechnologies, Chine* of the National Strategy of Research and Innovation of the French Ministry of Research in 2010.
- Member of Recruitment and Selection Committees: Toulouse Univ and INSA (2000-2004), Nice and Sophia Antipolis Univ. (2004-2007), Bordeaux 1 and 2 Univ. (2009-2010), Rennes Univ. (2010).
- Member of the Selection Committee of INRIA junior research fellows in 2010.

- **Member of the ANR (French Research Agency) projects :**

- *Pistage Radar et Optronique Passif.* [ANR Propagation] 2009.
- *Epidemic propagations analysis.* [ANR SYSCOMM Viroscopy].
- *Watermarking of digital contents.* [ANR SETIN Nebbiano] (2006-2010).
- *Virtual prairie.* [ANR MODECOL].
- *Forecasting and Data assimilation.* [ANR PREVASSEMBLE].
- *Probabilités & Interaction (2006-2009).*
[ANR Chaire d'Excellence Prof. P. Diaconis]

- **International institutes and scientific societies**

- Elected member of the **International Stat. Institute (ISI)** since 2006.
- Member of the MAS thematic group of the SMAI (industrial and applied mathematical society) (2005-2008).
- Member of the SMAI since 2005.
- Member of the SFdS and the SMF since 2009.

- **National and international research programs**

- Leader of the ARC EPS, Eco-Microbiology projet with the INRA (since 2009).

- French Coordinator of the China Associate INRIA team 2009 : 2AS (Wuhan Univ. with Prof. Wu Li Ming)
- Member of the ARC RARE. INRIA cooperative research action on rare event simulation (2005-2007).
- Member of the international cooperation between the ARMOR and ASPI INRIA team projects and the GERAD of Montréal University and HEC Montréal School (2005-2007).
- Scientific leader in Nice-Sophia Antipolis University of a methodological research project of the MIA INRA Dpt. : "Approche Statistique de la Dynamique des Systèmes Microbiologiques, et Applications à la Maîtrise des Risques Alimentaires" (2006).
- CNRS-Research Program on Particle Methods and Hidden Markov chains. Research Projet Math-STIC CNRS (2002-2003).
- MITACS Network on Prediction in Interacting Systems (1999-2005) .
- Project leader of the CNRS-Research Program on Particle Methods for Non Linear Filtering (1998-2001).
- TMR Network on Stochastic Analysis and Applications (1996– 2001).
- Principal investigator of the INTAS-RFBR, European Program on Idempotent Analysis (1996–1999).

- **Teaching**

- **Since 2007: Simulation and Stochastic Algorithms** (Master I & II Math), Bordeaux University (66h).
- **Academic year 2005/2006:**
Integration, probability and statistics (Master I Math), Financial mathematics (L3 Mass, and Ecole Polytechnique Universitaire Nice-Sophia Antipolis), Stochastic engineering (Master 2 MASS). Université de Nice, Sophia-Antipolis.
- **Academic year 2004/2005:**
Integration, probabilities and statistic (Master I Math), Financial Mathematics (L3 Mass), Dynamical Systems (L3 Mass), Statistics (Master Mass II). Sophia-Antipolis and Nice University.
- **Academic year 2003/2004:**
Formules de Feynman-Kac et systèmes de particules en interaction,
Second year graduate course in Applied Mathematics, Paul Sabatier University, Toulouse III.
- **Academic year 2002/2003:**
Introduction to Probability, Under graduate course, Dept. of Statistics, Purdue University, West Lafayette, Indiana-USA.
- **Academic year 2000/2001:**
Interacting particle approximations of non linear filtering problems
Post Graduate course, ORFE department, Princeton, New Jersey-USA.

– **Academic years 1996/1997 to 2001/2002:**

Simulation and Stochastic Algorithms [Statistics & Applied Probability]

-DESS Modèles Mathématiques et Mthodes Informatiques, Université Paul Sabatier, Toulouse III.

-Institut National des Sciences Appliquées, Toulouse III, France.

– **Academic year 1994/1995:**

[Harmonic Analysis, Statistics, Probability and Markov Processes]

Ecole Nationale Supérieure de l’Aéronautique et de l’Espace, Toulouse, France.

• **Ph. D. tutoring & supervision**

- Since November 2009, Arijit Das a Ph. D. in the INRIA Center of Bordeaux-Sud Ouest on statistical methods for electricity consumption prediction (co-tutoring with F. Caron).
- Since September 2009, Julie Marcelin Ph. D. in the INRIA Saclay on stochastic algorithms in Hidden Markov chain models (co-tutoring with M. Lavielle).
- Since 2009, Peng Hu a Ph. D. thesis in the INRIA Center of Bordeaux-Sud Ouest on Monte Carlo approximations of Snell envelopes and optimal stopping time problems.
- Since 2009, François Giraud a Ph. D. thesis in the CEA CESTA on SAR-ISAR Radar Imaging (co-tutoring with P. Minvielle).
- Since September 2008, Michele Pace is starting a Ph. D. thesis on computer implementations of a new generation of interacting stochastic search algorithms.
- Since september 2008, Aurélie Le Cain is starting a Ph. D. in the CEA CESTA on the statistical modeling of electromagnetic fields (co-tutoring with B. Bercu and A. Bourgade).
- Mathias Rousset (Polytechnique 99), from 2004 to 2007, on continuous time particle interpretations of Feynman-Kac-Schroedinger models.
- Christophe Baehr (Météo France Engineer), from 2004 to 2008, on filtering atmospheric turbulent fluids.
- Ph.D. examination jury member : Olivier Bardou (INRIA de Sophia Antipolis), Florent Malrieu (IRMAR, Univ. Rennes), Nadia Oudjane (Dpartement OSIRIS, EDF), Anastasia Papavasiliou (Princeton Univ.), Vivien Rossi (IRISA de Rennes), Sylvain Rubenthaler (Universit de Nice-Sophia Antipolis), Florian Simonatos (INRIA Rocquencourt).
- HDR examination jury member : Rama Cont (Polytechnique, CNRS), Fabien Campillo (IRISA de Rennes and INRIA Sophia Antipolis), Djalil Chafai (ENVT & LSP Toulouse) Manuel Davy (LAGIS-CNRS, Villeneuve d’Ascq), Madalina Deaconu (INRIA Nancy), Sylvain Rubenthaler (Lab. J.A. Dieudonné, Nice Sophia Antipolis Univ.).

• **Visiting positions**

- *Spring 2010* (one weeks) : **Oxford University, England** (Prof. T. Lyons).
- *Winter 2009* (one week) : **Imperial College, London** (Prof. D. Crisan).
- *Autumn 2009* (two weeks) : **La Havana University, Cuba**.

- *Autumn 2009* (one week) : **Erlangen University** (Prof A. Greven).
- *Winter 2009* (two weeks) : **Tokyo University, Japan** (Prof. A. Doucet).
- *Winter 2008* (one week) : **Oxford University, England** (Prof. P. Tarrès).
- *Spring 2008* (two weeks) : **Wuhan University, China** (Prof. Wu Liming).
- *Summer 2008* (one week) : SAMSU program, North Carolina University (Prof. A. Doucet).
- *Spring 2003* (six months): Department of Statistics, **Purdue University**, (Prof. F. Viens).
- *Summer 2002* (one month): Department of Electrical Engineering, **Melbourne University**, Australia (Professor Arnaud Doucet).
- *Spring 2002* (one week): Department of Mathematics, **Rolf Nevanlinna Institute** The 24th Finnish summer school in probability theory, Helsinki University, Finland (Professor D. Gasbara).
- *Autumn 2001* (two months): Department Operation Research and Financial Engineering, **Princeton University**, NJ. (Professor René Carmona).
- *Spring 1999* (one week): Department of Mathematical Sciences, **University of Alberta**, Edmonton (Professor M. Kouritzin).
- *Fall 1998* (one week) Laboratoire de Probabilités, **Université Paris 6**, Pierre et Marie Curie, Paris (Professor J. Jacod).
- *Winter 1997* (two weeks): Department of Mathematics, **Imperial College of Science**, Technology and Medicine, London (Professor T. J. Lyons).
- *Winter 1995* (one month): Institute for Problems in Mechanics, **Russian Academy of Sciences**, Moscow (Academician V. P. Maslov).

- **Workshop/Conference Organizations**

Workshops on *particle methods in filtering*: Interactions industry/university. The intent of these workshops is to bring together the applied probability and the engineering community to present current results in the field and to strengthen the potential for communication and collaboration between researchers.

- Workshop on rare event simulation, Bordeaux, October 2010.
- Workshop on Evolutionary Algorithms, March, 2010.
- Workshop on numerical methods in Finance, Bordeaux, June 2010.
- Workshop on Stochastic Algorithms Analysis, Bordeaux, France, June 16-18 2009.
- Workshop on multi-targets tracking, Bordeaux, France, May 14-15 2009.
- The First "Journées de Probabilités et Statistique de Bordeaux" with the CEA CESTA in october 2008.
- Workshop on Polymers models and related topics, Nice, Feb 2007.
- International Workshop on Rare Event Simulation (co-organized with G. Rubino, B. Tuffin), Nice April 2007.

- Conference MAS Lille 2006, Session : "Méthodes particulières en physique et en ingénierie stochastique".
- Satellite conference of the VI World Congress Bernoulli Society for Mathematical Statistics and Probability, Barcelone, July 2004
- Paris, Centre Emile Borel, Institut Henri Poincaré, June 2001 (co-organized with R. Carmona and J. Jacod).
- Cambridge, Math. Depart., December 1999 (co-organized with D. Crisan and A. Doucet).
- Rennes, CNRS/IRISA, June 1998 (co-organized with F. LeGland).
- Toulouse, LSP/CNRS December and April 1997.

- **Invited conferences**

- **(2010)**

- * Workshop on numerical methods for solving the filtering problem and high order methods for solving parabolic PDEs, Imperial College, Sept. 2010.
- * ICM, International Congress of Mathematicians, Satellite Conference on Probability and Stochastic Processes at the Indian Statistical Institute, Bangalore, August 13-17, 2010.
- * Workshop on SDE's for PK/PD modelling and simulation, Copenhagen University, Mai 2010.
- * University of Cambridge, Statistics Laboratory seminar, Feb. 2010.
- * Isaac Newton Institute for Mathematical Sciences, Workshop on filtering. June 2010
- * Analysis and Probability in Nice, 3rd workshop, Nov. 2010.
- * Workshop OPUS on rare events, Institut Henri Poincare, June 2010.
- * Workshop on Evolutionary Algorithms - Challenges in Theory and Practice, Bordeaux, March, 2010.
- * Workshop on numerical methods for computing American style options, Bordeaux, June 2010.
- * Workshop MODECOL : modelling clonal plant growth : from ecological concepts to mathematics , Rennes June 2010.

- **(2009)**

- * Stochastic Analysis Seminar, Imperial College, London, dec. 2009.
- * Journée Scientifique ONERA, Analyse d'événements rares, dec. 2009.
- * Journées 2009 du GDR Statistique et Santé. Univ. Paris-Descartes October 2009.
- * Recent Advancements in the Theory and Practice of Credit Derivatives. Laboratoire J.A. Dieudonne CNRS et Université de Nice Sophia Antipolis, September 2009.
- * Seminar, Department of Mathematics, Bristol University. October 2009.
- * 7th ISAAC Congress Imperial College London, July 13-18, 2009.

- * Cinquième Rencontre de Statistiques Mathématiques Bordeaux Santander Toulouse-Valladolid, june 3-5 Le Teich, 2009.
- * Ecole Optimisation et Controle des Ecoulements et des Transferts, Roscoff.
- * Workshop on Multi-target tracking, Bordeaux, France, May 14-15, 2009.

– (2008)

- * Rencontres GdR MASCOT-NUM, CEA Cadarache (March 12-14 2008). (3h lectures, slides to download)
- * Computational Mathematics, Numerical methods in molecular simulation Bonn (April 7-11th 2008). (3h lectures, slides to download)
- * Opening workshop, Sequential Monte Carlo Methods, SAMSI, Duke Univ. (September 7-10th 2008). (2h lectures, slides to download)
- * 10th Machine Learning summer school, Ile de Ré (September 1-15th 2008). (6h lectures, slides to download)
- * Colloquium du MAP5, Université Paris Descartes, (March 28th, 2008). (slides to download)
- * Rencontres EDP/Probas à l'Institut Henri Poincaré, Paris (March 2008) (slides to download)
- * Conference on Monte Carlo methods Theory and applications. Brown University (April 25-26, 2008). (slides to download)
- * Workshop on Probability and Statistics, Wuhan University (May 30, 2008). (slides to download)
- * Workshop on Probability and Statistics, Capital Normal University, Beijing (June 2nd 2008). (slides to download)
- * Colloque : Modélisation pour les Ressources Naturelles, INRA Montpellier (June 18-20 2008). (slides to download)
- * Analysis and Probability in Nice, Nice (June 23-28 2008). (slides to download)
- * International Workshop: Credit Risk, Evry (June 25-27 2008). (slides to download)
- * SIAM Conference on Nonlinear Waves and Coherent Structures, session Mathematical modeling of optical communication systems, Università di Roma La Sapienza (July 21-24 2008).
- * Workshop on Numerics and Stochastics, Helsinki University (August 25-29 2008). (slides to download)
- * Stochastic Analysis Seminar, Oxford University (December 1st, 2008). (slides to download)
- * Stochastic Analysis Seminar, Warwick University (December 3rd, 2008). (slides to download)
- * Seminar of the Statistics Department, Oxford University (December 4th, 2008). (slides to download)
- * Séminaire de Statistique et Santé Publique de l'IFR 99, Bordeaux 2, (December 9th 2008).
- * Workshop AST&Risk project, Approches Spatio Temporelles pour la modélisation du Risque, Lyon Univ., (December 11th 2008).

- * Seminaire UMPA, ENS Lyon, (December 12th 2008).
- (2007)
 - * **Workshop on Stochastic Processes and Algorithms** (September 3-7) 2007, Haussdorff Research Institute
 - * **Congres National de Mathematiques Appliquees et Industrielles**, SMAI Congress, (June 4-8) 2007, Praz sur Arly
 - * **Bioinformatics, Genetics and Stochastic Computation: Bridging the Gap, Banff** (July 1-6) 2007
 - * **Workshop : New directions in Monte Carlo Methods**, Fleurance (June 25-29) 2007.
 - * **Polymer Models and Related Topics (February 2007)** ANR Project : Probabilites et Interactions, Chaire d'Excellence Persi Diaconis.
 - * **Rencontres Nicoise de Mecanique des Fluides**, Lab. Cassiopee, Observatoire de Nice (January 2007).
- (2006)
 - * **Workshop Recent Advances in Monte-Carlo Based Inference**, Isaac Newton Institute, Cambridge, November 2006.
 - * **Journees MASS de la SMAI Lille**, September 2006. (Session "Mthodes particulaires appliques la physique et l'ingnierie").
 - * **Symposium on stochastic algorithms and Markov processes**, DMV meeting Bonn, September 2006
- (2005)
 - * **Colloque à l'Assemblee generale du departement MIA (Mathematique et Informatique Appliquees)**, INRA . Agde, October 2005
 - * **Colloque Statistique des processus, Applications au traitement du signal et de l'image**. Angers, September 2005.
 - * **Journees de Statistique et applications en biologie**. Rennes, September 2005.
 - * **Journes de statistique sur les modles donnees manquantes**, Universit Marne la Valle, February 2005.
- (2004)
 - * **Segundo Congreso Latinoamericano de Matemticos**, Cancun, Mexique, June 2004.
 - * **VI World Congress Bernoulli Society for Mathematical Statistics and Probability**, Barcelona, July 2004.
 - * **XXXVI Journées de Statistiques**, Montpellier, May 2004.
- (2003)
 - * **Stochastic Analysis with Applications** Meeting of the American Mathematical Society, Bloomington, USA, April 2003
- (2002)
 - * **Journée de probabilités CRM, Université de Montréal**, Montréal, Canada, November 2002.

- * **Stochastic Processes and their Applications**, Melbourne, Australie, July 2002 (invited plenary session).
 - * **Filtering 2002**, Jasper, Edmonton, Canada, July 2002.
- (2001)
- * **Congreso Latino Americano de Probabilidades Clapem VIII**, La Havana, Cuba, November 2001.
 - * **International Statistical Institute**, 53^{ème} session Seoul, August 2001.
 - * **Conference on Particle systems and filtering**, (co-organised with René Carmona and Jean Jacod) Institut Henri Poincaré, Paris, June 2001.
 - * **Workshop on discrete and continuous Stochastic Evolutions** (organisé par David Elworthy and Roger Tribe), Warwick Angleterre, March 2001.
- (2000)
- * **International Society for Bayesian Analysis, 6th World Meeting ISBA**, Hersonissos-Heraklion, Crete, June 2000.
 - * **4th International Conference on Operation Research, Optimization, Probability and Statistics**, Mathematical Economics and Algorithms, La Havana, Cuba, March 2000.
- (1999)
- * **Workshop on Practical and Theoretical Aspects of Particle Filters.**, (co-organisée avec Dan Crisan and Arnaud Doucet) Cambridge Angleterre, December 1999.
 - * **The Second EvoNet Summer School on Theoretical Aspects of Evolutionary Computing**, Anvers, Belgique, September 1999.
 - * **Colloquium Department of Mathematical Sciences University of Alberta**, Edmonton Canada, April 1999.
 - * **Workshop on Numerical Methods and Stochastics**, Fields Institute, Toronto canada, April 1999.
 - * **Workshop on Non Linear Filtering**, Uniqueness and Approximation Techniques for Solutions of Filtering Equations. Dipartimento di ingegneria elettrica, universita' degli studi dell'aquila, L'Aquila - Italie, January 1999.
- (1998)
- * **International Conference on Stochastic Analysis**, Institut Henri Poincaré, Paris June 1998.
 - * **International Conference dedicated to the 90th Anniversary of L.S. Pontryagin**, Moscow Russie, September 1998.
- (1997)
- * **Symposium on Stochastic Control and Nonlinear Filtering**, (organisée par B. Rozovsky), University of Southern California, Los Angeles USA, December 1997.
 - * **International Conference on Stochastic Analysis**, (organisée par D. Nualard), University of Barcelona, Spain, July 1997.

Publication List

Books

- [1] P. Del Moral, B. Rémillard, and S. Rubenthaler. *Intégration, Probabilités et Processus Stochastiques*. Ellipses, Paris, 2006.
 - [2] P. Del Moral. *Feynman-Kac formulae*. Probability and its Applications (New York). Springer-Verlag, New York, 2004. Genealogical and interacting particle systems with applications.
 - [3] N. Bartoli and P. Del Moral. *Simulation et algorithmes stochastiques : Une introduction avec applications*. Cépadués, Toulouse, 2001.
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Contributions to Books

- [4] P. Del Moral, and A. Doucet. Particle Methods: An introduction with applications HAL-INRIA RR-6991 [48p], July 2009. 2008 Machine Learning Summer School, Springer LNCS/LNAI Tutorial book no. 6368 (2010-2011).
- [5] P. Del Moral, and Fr. Patras. Interacting path systems for credit portfolios risk analysis HAL-INRIA RR-7196 [9p], (Feb. 2010). To appear in : Recent Advancements in the Theory and Practice of Credit Derivatives. D. Brigo, T. Bielecki, F. Patras Eds. Bloomberg Press (2010).
- [6] P. Del Moral, F. Patras, and S. Rubenthaler. A mean field theory of nonlinear filtering. HAL-INRIA, Technical Report RR 6437. In D. Crisan and B. Rosovsky, editors, *Oxford Handbook of Nonlinear Filtering*, pages 1–39. Oxford University Press, to appear (2010).
- [7] P. Del Moral, A. Doucet, and A. Jasra. Sequential monte carlo for bayesian computation. In *Bayesian Statistics 8*, pages 91–115. Oxford University Press, 2007.
- [8] P. Del Moral and P. Lezaud. Branching and interacting particle interpretations of rare event probabilities. In *Stochastic hybrid systems*, volume 337 of *Lecture Notes in Control and Inform. Sci.*, pages 277–323. Springer, Berlin, 2006.
- [9] D. A. Dawson and P. Del Moral. Large deviations for interacting processes in the strong topology. In *Statistical modeling and analysis for complex data problems*, volume 1 of *GERAD 25th Anniv. Ser.*, pages 179–208. Springer, New York, 2005.
- [10] I. Gentil, B. Rémillard, and P. Del Moral. Filtering of images for detecting multiple targets trajectories. In *Statistical modeling and analysis for complex data problems*, volume 1 of *GERAD 25th Anniv. Ser.*, pages 267–280. Springer, New York, 2005.

- [11] P. Del Moral and J. Jacod. The Monte-Carlo method for filtering with discrete-time observations: central limit theorems. In *Numerical methods and stochastic (Toronto, ON, 1999)*, volume 34 of *Fields Inst. Commun.*, pages 29–53. Amer. Math. Soc., Providence, RI, 2002.
- [12] P. Del Moral and J. Jacod. Interacting particle filtering with discrete observations. In *Sequential Monte Carlo methods in practice*, Stat. Eng. Inf. Sci., pages 43–75. Springer, New York, 2001.
- [13] P. Del Moral and J. Jacod. Interacting particle filtering with discrete-time observations: asymptotic behaviour in the Gaussian case. In *Stochastics in finite and infinite dimensions*, Trends Math., pages 101–122. Birkhäuser Boston, Boston, MA, 2001.
- [14] P. Del Moral and L. Miclo. Branching and interacting particle systems approximations of Feynman-Kac formulae with applications to non-linear filtering. In *Séminaire de Probabilités, XXXIV*, volume 1729 of *Lecture Notes in Math.*, pages 1–145. Springer, Berlin, 2000.
- [15] P. Del Moral. Maslov optimization theory: topological aspects. In *Idempotency (Bristol, 1994)*, volume 11 of *Publ. Newton Inst.*, pages 354–382. Cambridge Univ. Press, Cambridge, 1998.
- [16] P. Del Moral and G. Salut. Random particle methods in $(\max, +)$ optimization problems. In *Idempotency (Bristol, 1994)*, volume 11 of *Publ. Newton Inst.*, pages 383–391. Cambridge Univ. Press, Cambridge, 1998.
- [17] V. N. Kolokoltsov and V. P. Maslov. *Idempotent analysis and its applications*, volume 401 of *Mathematics and its Applications*. Kluwer Academic Publishers Group, Dordrecht, 1997. Translation of it Idempotent analysis and its application in optimal control (Russian), “Nauka” Moscow, 1994 [MR1375021 (97d:49031)], Translated by V. E. Nazaikinskii, With an appendix by Pierre Del Moral : Maslov Optimization Theory: Optimality Versus Randomness. [pp. 243–302].

Pure and Applied Probability Journals [MathSciNet]

- [18] Fr. Caron, P. Del Moral, M. Pace, and G.N. Vo. On the Stability and the Approximation of Branching Distribution Flows, with Applications to Nonlinear Multiple Target Filtering HAL-INRIA RR-7376 [50p], To appear in Stochastic Analysis and Applications (2010-2011).
- [19] N. Chopin, P. Del Moral and S. Rubenthaler. Stability of Feynman-Kac formulae with path-dependent potentials HAL : hal-00426415 (2009), To appear in Stochastic Processes and their Applications (2010-2011).
- [20] C. Andrieu, A. Jasra, A. Doucet, and P. Del Moral. On nonlinear Markov chain Monte Carlo via self-interacting approximations. Technical report, **Technical Report**, Imperial College of London, (2007). To appear in Bernoulli (2010-2011)

- [21] P. Del Moral. Fundamentals of stochastic filtering by Alan Bain and Dan Crisan Book Review [13p.], Bulletin of the American Mathematical Society, to appear (2010).
- [22] A. Jasra, P. Del Moral. Sequential Monte Carlo Methods for Option Pricing, [37p.] To appear in Stoch. Anal. Appl. (2010)
- [23] P. Del Moral, A. Doucet, and S. S. Singh. A Backward Particle Interpretation of Feynman-Kac Formulae HAL-INRIA RR-7019 [21p] (2009). vol 44, no. 5, pp. 947–976 M2AN (2010).
- [24] Pierre Del Moral and N. Hadjiconstantinou An Introduction to probabilistic methods, with applications *Preface to a special volume on probabilistic methods*. vol 44, no. 5, pp. 805–830 M2AN (2010)
- [25] P. Del Moral, A. Doucet. A new class of interacting Markov chain Monte Carlo methods *Comptes rendus Académie des Sciences, Série : Mathématiques* Vol. 348 - N 1-2, p. 79-83 (2010).
- [26] F. Cerou, P. Del Moral, and A. Guyader. A non asymptotic variance theorem for unnormalized Feynman-Kac particle models. Technical report, HAL-INRIA, Technical Report RR 6716, November 2008. To appear in the journal *Annales de l'Institut Henri Poincaré* (2010).
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