

## Shuyan LIU

born on January 1st 1982 in Nanjing (China), female, single.

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SAMM, Université Paris 1

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### Current position

**Associate Professor** at Université Paris 1 Panthéon Sorbonne, member of SAMM since September 2010.

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### Research topics

Regular variation of time series

Stable distributions on convex cones

Simulation and estimation of parameters for multivariate stable distributions

Point processes

Application to astronomical and financial data

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### Publications

- Y. Davydov, S. Liu, *Transformations des lois multivariées à queues régulières*, Revue Roumaine de Mathématiques Pures et Appliquées **55** (2010), 6, 483-492.
  - R. Stoica, S. Liu, Y. Davydov, M. Fouchard, A. Vienne, G. B. Valsecchi, *Order statistics and heavy-tail distributions for planetary perturbations on Oort cloud comets*, Astronomy and Astrophysics **513** (2010), A14.
  - S. Liu, *Illustration par quelques exemples des lois strictement stables dans un cône convexe*, (preprint, arXiv :1302.3403).
  - Y. Davydov, S. Liu, *Estimation of parameters of regularly varying distributions on convex cones*, (preprint, arXiv :1006.5655).
  - J. Segers, S. Liu, *Multivariate  $MA(\infty)$  processes with heavy tails and random coefficients*, (preprint, hal-00624123).
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## Education

- 10/2005-12/2009 **Ph.D. thesis** in Applied Mathematics at Université Lille 1  
*Title* : Stable distributions and point processes : relationship and estimation of parameters  
*Advisor* : Youri DAVYDOV  
*Mention* : Très honorable  
*Defense date* : December 10th 2009
- 10/2004-07/2005 **M.Sc.** in Applied Mathematics at Université Lille 1
- 09/2002-01/2004 **Master** in Applied Mathematics at Hohai University, China
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## Scientific Career

- 02/2010-08/2010 **Postdoctoral Scholar** in the Institute of Statistics of the Université Catholique de Louvain, Belgium, under the supervision of Johan Segers
- 09/2008-12/2009 **Temporary researcher and teacher (A.T.E.R.)** at Université Lille 1
- 10/2005-09/2008 **Research grant** of MESR
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## Scientific Activities

### Oral Communications

- *Estimation of parameters of regularly varying distributions with an application on planetary perturbations on comets.* Workshop on Alpha-Stable Processes for Signal Processing and Communications, Lille, December 2012.
- *Multivariate  $MA(\infty)$  processes with heavy tails and random coefficients.* 10th International Conference on Operations Research, Habana, Cuba, March 2012.
- *Multivariate  $MA(\infty)$  processes with heavy tails and random coefficients.* International Meeting on Probability and Statistics, Algiers, Algeria, November 2011.
- *Lois stables dans un cône convexe et estimation des paramètres.* 4èmes Rencontres des Jeunes Statisticiens, Aussois, September 2011.
- *Principe de grandes déviations et théorème de Cramer.* Groupe de travail "Probabilité" du SAMM, Paris, March 2011.
- *Estimation des paramètres d'une loi à queue régulière dans un cône convexe.* Séminaire SAMM, Paris, December 2010.
- *Estimation de la mesure spectrale d'une loi à queue régulière dans un cône convexe.* Journées MAS, Bordeaux, September 2010.
- *Lois stables et lois à queue régulière dans un cône convexe.* Neuvième Colloque "Jeunes Probabilistes et Statisticiens", Le Mont-Dore, May 2010.
- *Lois stables et processus ponctuels : liens et estimation des paramètres.* Séminaire invité par E. Saint Loubert Bié, Clermont-Ferrand, April 2010.
- *Estimation of parameters of regularly varying tail distributions on convex cones.* Statistics seminar organized jointly with IAP-network, Louvain-la-Neuve, Belgique, February 2010.
- *Estimation of parameters of regularly varying tail distributions.* École d'été "La dynamique des systèmes gravitationnels : défis et perspectives", Aussois, June 2009.
- *Inférence paramétrique pour les processus ponctuels marqués.* Groupe de travail "Géométrie Stochastique" du Laboratoire Paul Painlevé, Lille, April 2009.

- *Lois avec queues régulières et estimation des paramètres.* Mécanisme de Transport des Comètes du Nuage de Oort, Observatoire de Lille, April 2008.
- *Estimation des paramètres des lois stables dans le cône convexe et ses applications.* Journées des Doctorants en Mathématiques, Wimereux, March 2008.
- *Estimation of parameters of stable distributions on convex cones.* École d'été de Probabilités Saint-Flour, Clermont-Ferrand, séjour de 15 jours, participation au cours de système dynamique, chaos-stabilité et EDS, July 2007.
- *Estimation des mesures spectrales stables.* Séminaire des doctorants/post-doctorants, Lille, December 2006.

### Working Group

- From November 2011, participation in the research project (Groupe de Recherche, GdR) of CNRS “Géométrie stochastique” led by P. Calka.
- From November 2010, participation in the Working Group “Probability” in the team SAMM organized by J. Randon-Furling.
- 3-12 September 2012, participation in the course “Gestion des risques et extrêmes” of Université de Cergy-Pontoise organized by P. Doukhan.
- From February to August 2010, participation in the course “Special topics in mathematical statistics” in the ISBA of UCL organized by I. Van Keilegom.
- From September 2008 to December 2009, participation in the Working Group “Géométrie Stochastique” in the Laboratory Paul Painlevé organized by Y. Davydov.

### Participation in Conferences, without talks

- Workshop on Stochastic Geometry and its Applications, Rouen, 28-30 March, 2012.
- Interdisciplinary workshop on “Econometric and statistical modelling of multivariate time series”, Louvain-la-Neuve, Belgium, 25-27 May 2011.
- Stochastic Geometry Days, Lille, 30 March-1st April 2011.
- Journées de Géométrie Aléatoire, Lille, 3-4 December 2008.
- National Congress of Applied and Industrial Mathematics, SMAI 2007, Chambéry, stay of 5 days, June 2007.
- Stochastic Processes and Random Fractals, Lille, March 2006.

## Teaching Activities

- 2010-present **Associate Professor** at Université Paris 1 Panthéon Sorbonne  
(about 200h/year)  
L1 : MASS, Practical work of Language C  
L2 : MASS and Economy, Course and Practical work of Probability and Statistics  
L3 : MASS, Course and Practical work of Numerical Methods  
M1 : MAEF, Course and Practical work of Linear Econometrics  
MMEF/QEM, Practical work of Linear Algebra (in English)  
M2 : COSI, Course of Linear Econometrics  
TIDE, Course of programming with SAS/IML  
Supervising teacher of TER of Master 1 MAEF, J. NICOLAS
- 2010 **Postdoctoral** at Université Catholique de Louvain (10h)  
L2 : Economy and Management, Practical work of Descriptive Statistics
- 2008-2009 **Temporary researcher and teacher (A.T.E.R.)** at Université Lille 1 (126h)  
L1 : Course-Practical work of Descriptive Statistics  
L2 : Practical work of Linear Algebra  
Practical work of Probability and Statistics
- 2007-2008 **Instructor** at École Nationale Supérieure des Arts et Industries Textiles (64h)  
Student engineers of the 1st and the 3rd year :  
Practical work with Maple of Operational Research and Decision Support  
Practical work with Scilab of Statistics and Probability
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## Language and Computer Skills

- Computer Skills** Operating systems : Windows, Linux, Unix.  
Word processing : Latex, Microsoft office.  
Programming : Matlab, Maple, R, Scilab, C, Fortran, SAS.
- Languages** French : fluent.  
Chinese : mother tongue.  
English : scientific.
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## Other

- 03/2004-07/2004 Intensive french course at Université Lille 1.
- 01/2004-03/2004 French course at the Alliance Française in Nanjing (China).
- 12/2003 Student exchange Master 2 selected under the agreement between Hohai University and Université Lille 1.
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## Hobbies and Interests

handicraft, swimming, reading, cinema.