# Paul Balança

Post-doc
Faculty of Industrial Engineering and Management
Technion - Israël Institute of Technology
32000 Haifa - Israël

paul.balanca@gmail.com
http://balancap.github.io

## Research interests

Probability theory • fractal geometry • 2-microlocal and multifractal analysis • (multi)fractional processes • Lévy processes • continuous random trees • superprocesses

## Academic positions & Education

March 2014- **Post-doc in collaboration with Leonid Mytnik**
*Technion (IEM)* - Fellowship of the Technion and the french embassy in Israel
Subject : Geometry of continuous random trees and superprocesses

2010-Feb. 2014 **Ph.D. in Probability under the supervision of Erick Herbin**
*École Centrale Paris (MAS)* - Science ministry research grant
Title: Fine regularity of stochastic processes and 2-microlocal analysis
Jury : Antoine Ayache, Thomas Duquesne, Erick Herbin, Christian Houdré, Stéphane Jaffard et Ivan Nourdin

Feb.-Sept. 2009 **Research internship in image processing**
*University of Houston (Computational Biomedicine Lab)*
Subject: Automatic segmentation on CT scans

2009-2010 **MSc in Probability & Statistics**
*Université Paris-Sud XI, Orsay*

2007-2010 **Grande École - MSc in Applied Mathematics**
*École Centrale Paris*

## Publications

### Journals & Preprints

[1] P. Balança and E. Herbin. **2-microlocal analysis of martingales and stochastic integrals**. *Stochastic Process. Appl.* **122**.6 (2012), pp. 2346–2382. doi: 10.1016/j.spa.2012.03.011. arXiv: 1107.6016.

[2] P. Balança and E. Herbin. **A set-indexed Ornstein–Uhlenbeck process**. *Electron. Commun. Probab.* **17**.39 (2012), pp. 1–14. doi: 10.1214/ECP.v17-1903. arXiv: 1203.5524.

[3] P. Balança. **An increment type set-indexed Markov property**. *J. Theoret. Probab.* (2014), pp. 1–40. doi: 10.1007/s10959-014-0555-y. arXiv: 1207.6568.

[4] P. Balança. **Fine regularity of Lévy processes and linear (multi)fractional stable motion**. *Electron. J. Probab.* **19** (2014), no. 101, 37. doi: 10.1214/EJP.v19-3393. arXiv: 1302.3140.

[5] P. Balança. **Some sample path properties of multifractional Brownian motion**. *Stochastic Process. Appl.* **125**.10 (2015), pp. 3823–3850. doi: 10.1016/j.spa.2015.05.008. arXiv: 1408.0317.

[6] P. Balança. **Image sets of fractional Brownian sheets**. *Submitted* (2015), pp. 1–14. arXiv: 1507.08466.

[7] P. Balança. **Uniform multifractal structure of stable trees**. *Submitted* (2015), pp. 1–40. arXiv: 1508.00229.

[8] P. Balança and L. Mytnik. **Regularity and singularities of stable super-Brownian motion**. *In preparation* (2015).

### Miscellaneous

[1] D. Chittajallu, P. Balança, and I. Kakadiaris. **Automatic delineation of the inner thoracic region in non-contrast CT data**. *Engineering in Medicine and Biology Society (EMBC) 2009. Annual International Conference of the IEEE*. 2009, pp. 3569–3572. doi: 10.1109/IEMBS.2009.5332585.

[2] R. Yalamanchili, D. Chittajallu, P. Balança, B. Tamarappoo, D. Berman, D. Dey, and I. Kakadiaris. **Automatic segmentation of the diaphragm in non-contrast CT images**. *From Nano to Macro, 2010 IEEE International Symposium on Biomedical Imaging*. 2010, pp. 900–903. doi: 10.1109/ISBI.2010.5490132.

## Conferences & Seminars

| | |
|---|---|
| Sept. 2015 | *Fractals and Related Fields III*, Porquerolles. |
| July 2015 | *38th Conference on Stochastic Processes and their Applications*, University of Oxford. |
| June 2015 | *Stochastic Processes and Random Fields: Geometry and Fine properties*, Technion. |
| May 2015 | *Probability seminar*, Technion. |
| May 2015 | *Students Probability Day V* , Weizmann Institute. |
| Sept. 2014 | *GDR d'analyse multifractale*, Domaine de Chalès - Orléans. |
| July 2014 | *École d'été de Probabilités*, Saint Flour. |
| Fév. 2014 | *Multifractal Analysis Workshop*, Banff International Research Station. |
| Oct. 2013 | *Groupe de travail en Probabilités*, Université Paris Descartes. |
| July 2013 | *7th International Conference on Lévy Processes*, Wrocław. |
| June 2013 | *Journées de Probabilités*, Université d'Orléans. |
| May 2013 | *Séminaire Cristolien d'Analyse Multifractale*, Université Paris-Est Créteil. |
| July 2012 | *8th World Congress in Probability and Statistics*, Istanbul. |
| Oct. 2012 | *Ph.D. Students Seminar*, École Centrale Paris. |
| June 2011 | *Journées de Probabilités*, Université de Nancy. |

## Teaching

2015 **Technion** - Crash course on continuous Lévy trees.

2013 **Teaching Assistant at ENSAE**
- *Functional and convex analysis*, 1st year students (30 hours/year).

2010-2013 **Teaching Assistant at École Centrale Paris**
- *Analysis*, 1st year students (10 hours/year);
- *Probability*, 1st year students (10 hours/year);
- *Statistics*, 1st year students (10 hours/year);
- *Advanced Probability*, 2nd year students (18 hours/year).

## Scientific activities

Reviewer for *Annals of Probability*, *Statistics & Probability Letters*

2014-2015 Scientific watch for the *French embassy in Israel* ($\sim$ 25 short articles per year).

Mar. 2014 Co-organization of the *Conference in honour of Kenneth Falconer's 60th birthday*, at INRIA Saclay.

2012-2013 Organization of the Ph.D. Students Seminar at MAS laboratory, ECP.

2012-2013 Software maintainer of the Matlab toolbox *FracLab* (http://fraclab.saclay.inria.fr).

2012-2013 Member of the MAS laboratory council, ECP.

## Miscellaneous

Languages: French (mother tongue) • English (fluent) • German (basics)

Computer skills: C++ • Python • Matlab • HTML & CSS • LaTeX