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Curriculum vitae

Thomas Verdebout, homepage: http://tverdebo.ulb.ac.be

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1. Personal details

Name: VERDEBOUT Thomas, René, Jacques, Jean.

Gender: Male.

Born: January 14, 1983 in Tournai, Belgium.

Citizenship: Belgian.

Address (private): Rue Lambert Vandervelde 34, B-1170 Brussels, Belgium.

Address (professional): Université libre de Bruxelles (Campus Plaine), Boulevard du Triomphe, CP210, B-1050 Brussels, Belgium.

Phone number (professional): (+32) 02.650.58.92.

E-mail address: tverdebo@ulb.ac.be

Languages: French, English.

2. Education

2013: *Habilitation (HDR)*

Dissertation: "Contribution to multivariate analysis and inference for directional data" (Lille, France, defense date: 2013/11/22).

2006–2008: *PhD in Sciences (Statistics)*

Université libre de Bruxelles (ULB).

Dissertation: "Optimal inference for one-sample and multisample Principal Component Analysis" (advisors: Marc Hallin and Davy Paindaveine, defense date: 2008/10/24).

2005–2006: *Master Degree in Statistics and Operational Research (1 year program)*

Université libre de Bruxelles (ULB).

Final grade: Magna Cum Laude (grande distinction).

2001–2005: *Licence Degree in Mathematics (4 years program)*

Université Libre de Bruxelles.

Final grade: Magna Cum Laude (grande distinction).

1995–2001: *Secondary School Certificate*

Athénée Royal Jules Bara, Tournai.

3. Professional career

2014–present: *Tenured Junior Professor* (Chargé de cours) at the Mathematics Department, Université libre de Bruxelles (ULB).

2009–2014: *Assistant Professor* at the laboratoire EQUIPPE, Université Lille 3.

2005–2009: *Full-time teaching assistant* at the School of Social and Political Sciences and the Solvay Brussels School of Economics and Management, Université libre de Bruxelles (ULB).

2004–2005: *Student-assistant* for the course "Modèles linéaires et non linéaires", Université libre de Bruxelles (ULB).

Courses taught: Asymptotic Statistics, Mathematical Statistics, Calculus I, Stochastic Processes, Multivariate Data Analysis, Regression Models, Introduction to graph theory, Descriptive Statistics.

4. Other teaching experiences, research visits

2016-2017: Solvay Brussels School of Economics and Management, Université libre de Bruxelles (ULB). Course taught: First part of Applied Multivariate Analysis (Master in Economics, Financial Engineering and Statistics).

2016-2017: Solvay Brussels School of Economics and Management, Université libre de Bruxelles (ULB). Course taught: Second part of Estimation Theory (Advanced Master in Quantitative Finance).

2015-2016: Solvay Brussels School of Economics and Management, Université libre de Bruxelles (ULB). Course taught: Second part of Estimation Theory (Advanced Master in Quantitative Finance).

2014-2015: Faculté des Sciences, Université libre de Bruxelles (ULB). Course taught: Robust statistics (MA).

2014–2015: UFR de Mathématiques appliquées, Université de Lille. Course taught: Statistique asymptotique (MA1 Applied Mathematics).

2014–2015: Faculté des Sciences, Université de Liège. Course taught: Statistiques générales

et traitement de données (jointly with Y. Swan, 2nd Bachelor in Geography and 3rd Bachelor in Biology).

2014: Visiting researcher at the ORFE department, Princeton University (USA) between 26/11/2014 and 03/12/2014.

2013–2014: Solvay Brussels School of Economics and Management, Université libre de Bruxelles (ULB). Course taught: Applied Multivariate Analysis (Master in Economics, Financial Engineering and Statistics).

2012–2013: Solvay Brussels School of Economics and Management, Université libre de Bruxelles (ULB). Course taught: Statistics 2 (Bachelor in Economics and Financial Engineering).

2012: Short course on Directional Statistics (ULB).

2012: Visiting researcher at the ORFE department, Princeton University (USA) between 04/11/2012 and 11/11/2012.

5. Awards, distinctions, grants, editorial services

2016–present: Associate Editor for Journal of Multivariate Analysis.

2014–present: Associate Editor for Statistics and Probability Letters.

2015: Grant form the National Bank of Belgium (BNB).

2013: Elected member of the International Statistical Institute (ISI).

2012: Prime for scientific excellence (Prime d'excellence scientifique, France), 2012-2016.

2011: Annual price in applied Mathematics (prix du concours annuel) of "la Classe des Sciences de l'Académie Royale de Belgique" .

2011 : Special ASA Journal of Nonparametrics Statistics invited paper at the Graybill conference in Fort-Collins, Colorado, USA, for the paper "Rank-based Inference in Linear Models with Stable Errors"

6. Academic services, memberships

2016-present: Member of the IMS.

2016-present: Member of the Bernoulli Society.

2015-present: Secretary and treasurer of ECAS (European Courses in Advanced Statistics).

2016: Member of the scientific committee of the CMStatistics conference in Sevilla.

2016: Organizer and chairman of a session about Directional Statistics at the CMStatistics conference in Sevilla.

2015: Member of the organizing committee of the meeting in honor of T.Bruss.

2015: Organizer and chairman of a session about Directional Statistics at the CMStatistics conference in London.

2015: Member of the organization committee of the 47th Journées de Statistique de la SfdS, Lille.

2014: Organizer and chairman of a session about Directional Statistics at the ERCIM 2014 conference in Pisa.

2014: Co-organizer of the Advances in Directional Statistics conference in Brussels.

2012–2014: Elected member of the laboratoire EQUIPPE council.

2010–2014: In charge of the EQE (Quantitative Economics and Econometrics) licence in the Université Lille 3.

2010–2014: Organizer of the seminar of Econometrics and Statistics at the laboratoire EQUIPPE.

2009: Member of the scientific committee at the meeting in honor of Marc Hallin.

Referee reports for *Annals of Statistics*, *Journal of the American Statistical Association*, *Bernoulli*, *Statistica Sinica*, *Journal of Econometrics*, *Journal of Multivariate Analysis*, *Electronic Journal of Statistics*, *Journal of Machine Learning Research*, *IEEE Transactions on Signal Processing*, *IEEE Transactions on Information Theory*, *Canadian Journal of Statistics*, *Test*, *Journal of Statistical Planning and Inference*, *Statistics and Probability Letters*, *International Statistical Review*, *Computational Statistics and Data Analysis*, *The American Statistician*, *Computational Statistics*, *Journal of Statistical Computation and Simulation*, *Statistical Inference for Stochastic Processes*, *North Western European Journal of Mathematics*, *Studies in Nonlinear Dynamics and Econometrics*.

7. Research interests

My main research activities are concentrated around the following topics :

1. Optimal (in the Le Cam sense) inferential procedures
2. Rank-based procedures
3. New models and inferential methods for directional statistics
4. High-dimensional inferential procedures
5. Inference under heavy-tailed distributions
6. Robust Statistics
7. Non- and semi-parametric statistics

8. Published papers and preprints

Preprints

1. Optimal tests for circular reflective symmetry about an unknown central direction, **submitted** (coauthors: J.Ameijeiras-Alonso, C.Ley, A. Pewsey).
2. On optimal tests for rotational symmetry against new classes of hyperspherical distributions, **submitted** (coauthors: E. Garcia-Portugues and D. Paindaveine).
3. Le Cam maximin tests for symmetry of circular data based on the characteristic function, **submitted** (coauthor: S.Meintanis).

Published and accepted papers

4. On the efficiency of some rank-based test for the homogeneity of concentrations, **Journal of Statistical Planning and Inference**, Vol.191, 101–109 (2017).
5. Testing uniformity on high-dimensional spheres against contiguous rotationally symmetric alternatives, **Annals of Statistics**, Vol. 45, 1024–1058 (2017) (coauthors: Chr.Cutting and D.Paindaveine).
6. Skew-rotationally-symmetric distributions on the unit sphere and related efficient inferential procedures, **Journal of Multivariate Analysis**, Vol. 159, 67–81 (2017) (coauthor: C.Ley).
7. Inference on the mode of weak directional signals: a Le Cam perspective on hypothesis testing near singularities, **Annals of Statistics**, Vol. 45, 800–832 (2017)

(coauthor: D.Paindaveine).

8. On the estimation of the density of a directional data stream, ***Scandinavian Journal of Statistics***, Vol. 44, 249–267 (2017) (coauthors: A.Amiri and B.Thiam).

9. Preliminary test estimation for multi-sample principal components, ***Econometrics and Statistics***, Vol. 2, 106–116 (2017) (coauthors: Davy Paindaveine and J. Rasoafaraniaina).

10. Tests of concentration for low-dimensional and high-dimensional directional data, In S. Ejaz Ahmed Ed., ***Big and Complex Data Analysis: Statistical Methodologies and Applications, Springer,Cham Heidelberg New York***, 209-227 (2017). (coauthors: Chr.Cutting and D.Paindaveine).

11. Efficient ANOVA for directional data, ***Annals of the Institute of Statistical Mathematics***, Vol. 69, 39–62 (2017) (coauthors: C.Ley and Y.Swan).

12. Universal asymptotics for high-dimensional sign tests, ***Bernoulli***, Vol. 22, 1745-1769 (2016) (coauthor: D.Paindaveine).

13. On some validity-robust tests for the homogeneity of concentrations, ***Journal of Nonparametric Statistics***, Vol. 27, 372-383 (2015).

14. High-dimensional tests for spherical location and spiked covariance, ***Journal of Multivariate Analysis***, Vol. 139, 79-91 (2015) (coauthors: C.Ley and D. Paindaveine).

15. Optimal rank-based tests for the location parameter of a rotationally symmetric distribution on the hypersphere. ***Mathematical Statistics and Limit Theorems – Festschrift in Honour of Paul Deheuvels, Springer***, 249-270 (2015) (coauthor: D.Paindaveine).

16. Local powers of optimal one- and multi-sample tests for the concentration of Fisher-von Mises-Langevin distributions. ***International Statistical Review***, Vol. 82, 440–456 (2014) (coauthor: C.Ley).

17. Efficient R-estimation of principal and common principal components. ***Journal of the American Statistical Association***, Vol. 109, 1071-1083 (2014) (coauthors: M. Hallin and D.Paindaveine).

18. Simple, asymptotically distribution-free, optimal tests for reflective symmetry about a known circular median. ***Statistica Sinica***, Vol. 24, 1319-1340 (2014) (coauthor:

C.Ley).

19. A new concept of quantiles for directional data and the angular Mahalanobis depth. ***Electronic Journal of Statistics***, Vol. 8, 795-816 (2014) (coauthors: C.Ley and C.Sabbah).

20. On Hodges and Lehmann's "6/pi result". ***Contemporary Developments in Statistical Theory, Springer***, 137-153 (2014) (coauthors: M.Hallin and Y.Swan).

21. Optimal rank-based tests for Common Principal Components, ***Bernoulli***, Vol. 19, 2524-2556 (2013) (coauthors: M. Hallin and D. Paindaveine).

22. Optimal R-estimation of a spherical location. ***Statistica Sinica***, Vol. 23(1), 305-333 (2013) (coauthors: C. Ley, Y. Swan and B.Thiam).

23. R-estimation in linear models with stable errors. ***Journal of Econometrics***, Vol. 172(2), 195-204 (2013) (coauthors: M.Hallin, Y.Swan and D.Veredas).

24. Common principal components. ***Encyclopedia of Environmetrics*** Second Edition, A.-H. El-Shaarawi and W. Piegorsch (eds). John Wiley & Sons Ltd, Chichester, UK, pp. 447-449 (2012).

25. A contribution to asymptotic inference on eigenvectors and eigenvalues of covariance and scatter matrices. ***Mémoire de l'Académie Royale des Sciences, des Lettres et des Beaux-Arts*** (2012).

26. Rank-based tests for elliptical graphical modeling. ***Journal de la Société Française de Statistique***, Vol. 153, 82-100 (2012) (coauthor: D.Paindaveine).

27. Rank-based testing in linear models with stable errors. ***Journal of Nonparametric Statistics***, Vol. 23, 305-320 (2011) (coauthors: M.Hallin, Y.Swan and D.Veredas).

28. Optimal rank-based tests for Principal Component Analysis. ***Annals of Statistics***, Vol. 38, 3245-3299 (2010) (coauthors: M. Hallin and D. Paindaveine).

29. Testing for common principal components under heterokurticity. ***Journal of Nonparametric Statistics***, Vol. 22, 879-895 (2010) (coauthors: M. Hallin and D. Paindaveine).

30. Pseudo-Gaussian inference in heterokurtic elliptical Common Principal Components model. ***Annales de l'ISUP***, LII, 9-24 (2008) (coauthors: M. Hallin and D. Paindaveine).

9. Talks in conferences and seminars

1. (Invited) 3rd Workshop on Goodness-of-Fit and Change-point problems, KIT, Karlshrue (Germany), September 2017.

2. (Invited) ADISTA 17 workshop, University Roma 3 (Italy), June 2017.

3. (Invited) Statistics Seminar, ULG, Liège (Belgium), April 2017.

4. (Invited) Statistics Seminar of the University Carlos 3, Madrid (Spain), March 2017.

5. (Invited) 9th International Conference of the ERCIM WG on Computing & Statistics (CMStatistics 2016), Sevilla (Spain), December 2016.

6. Annual meeting of the Belgian Statistical Society, Namur (Belgium), October 2016.

7. (Invited) Séminaire parisien de la Statistique, Institut Henri Poincaré, Paris (France), September 2016.

8. (Invited) 3rd ISNPS conference on Nonparametric Statistics, Avignon (France), June 2016.

9. (Invited) 8th International Conference of the ERCIM WG on Computing & Statistics (CMStatistics 2015), London (UK), December 2015.

10. (Invited) Joint Statistics Seminar, KUL, Leuven (Belgium), April 2015.

11. (Invited) 7th International Conference of the ERCIM WG on Computing & Statistics (ERCIM 2014), Pisa (Italy), December 2014.

12. (Invited) ULB-UCL seminar, UCL, Louvain-La-Neuve (Belgium), November 2014.

13. (Invited) ADISTA 14 conference, Brussels (Belgium), May 2014.

14. (Invited) 6th International Conference of the ERCIM WG on Computing & Statistics (ERCIM 2013), London (UK), December 2013.

15. (Invited) Statistics seminar of the Laboratoire Paul Painlevé, Univesité Lille 1, Lille (France), December 2013.

16. (Invited) Statistics seminar of the Toulouse School of Economics, Toulouse (France), November 2013.

17. (Invited) Brussels Summer School of Mathematics, Brussels (Belgium), August 2013.

18. The 32nd Leeds Annual Statistical Research Workshop, Leeds (UK), July 2013.

19. (Invited) INRIA seminar, Lille (France), December 2012.

20. 5th International Conference of the ERCIM WG on Computing & Statistics (ERCIM 2012), Oviedo (Spain), December 2012.

21. (Invited) Statistics seminar, Université Libre de Bruxelles, Bruxelles (Belgium), Oc-

tober 2012.

22. Journée du laboratoire EQUIPPE, Lille (France), Juin 2012.

23. 43ème journées de la Société Française de Statistique, Bruxelles (Belgium), May 2012.

24. Annual meeting of the Belgian Statistical Society, Hasselt (Belgium), October 2011.

25. (Invited) Statistics seminar of the ORFE department, Princeton University (USA), April 2010.

26. 4th Belgium-Japan seminar on Time Series and Financial Statistics, Bruxelles (Belgium), June 2009.

27. 41ème journées de la Société Française de Statistique, Bordeaux (France), May 2009.

28. (Invited) Statistics seminar of the LSTA, Université Pierre et Marie Curie, Paris (France), January 2009.

29. (Invited) Seminar in honor of Hirotsugu Akaike, Recent developments in Statistics and Econometrics, Kyoto (Japan), November 2008.

30. 3rd Belgium-Japan seminar on Time Series and Financial Statistics, Izu (Japan), November 2008.

31. 2nd Belgium-Japan seminar on Time Series and Financial Statistics, Bruxelles (Belgium), June 2008.

32. (Invited) Joint meeting of the Statistical Society of Canada and the Société Française de Statistique, Ottawa (Canada), May 2008.

33. Belgium-Japan seminar on Time Series and Financial Statistics, Hakone (Japan), October 2007.

34. Young Statistician day, 15th Annual meeting of the Belgian Statistical Society, Antwerpen (Belgium), October 2007.

35. 2ème Journées des jeunes Statisticiens de la Société Française de Statistique, Aussois (France), September 2007.

36. Workshop on robust and nonparametric statistical inference, Hejnice (Czech Republic), September 2007.

37. 36éme Journées de la Société Française de Statistique, Angers (France), June 2007.

10. PhD/Master Students Supervisions and jury of PhD theses

Supervision of Phd Students:

1. 2014-present: Joséa Rasoafaraniaina, *working title: Preliminary test estimation in locally and asymptotically normal models*, co-supervision with D. Paindaveine.

2. 2014-present: Christine Cutting, *working title: Asymptotics of sign-based test in the high-dimensional case*, co-supervision with D. Paindaveine.

3. 2016-present: Julien Rémy, *working title: Asymptotic inference in the vicinity of singularities*, co-supervision with D. Paindaveine.

Supervision of research works:

1. 2017: Pawel Krynski, BA 3 Mathematics, Université libre de Bruxelles.
2. 2017: Youssef Ben Abdelkader, BA3 Mathematics, Université libre de Bruxelles.
3. 2017: Toyo Vignal, BA3 Mathematics, Université libre de Bruxelles.
4. 2016: Xavier Mauquoy, MA1 Mathematics, Université libre de Bruxelles.
5. 2015: Julien Rémy, MA1 Mathematics, Université libre de Bruxelles.

Supervision of Master Students:

1. 2017: Mohamed Heni, MA2 Statistics, Université libre de Bruxelles.
2. 2016: Félix Vanderoost, MA2 Actuarial Sciences, Université libre de Bruxelles.
3. 2016: Romain Boulanger, MA2 Solvay Brussels School of Economics and Management, Université libre de Bruxelles.
4. 2014: Paul Ternynck, MA2 Université Lille 3, "Analyse de données statistiques chez Reco International", co-supervision with B. Thiam.
5. 2013: Guillaume Dreesen, MA2 Université Lille 3, "Etude sociodémographique et création d'un score clients à La Redoute".

Jury of PhD theses:

1. 2017: Lorenzo Ricci, Université libre de Bruxelles (ULB) "Essays on tail risk in macroeconomics and finance: measurement and forecasting". Supervisors: Davy Paindaveine and David Veredas.

2. 2015: Isabelle Charlier, Université libre de Bruxelles (ULB) "Conditional quantile estimation through optimal quantization". Supervisors: Davy Paindaveine and Jérôme Saracco.

3. 2014: Lukasz Kidzinski, Université libre de Bruxelles (ULB), "Inference for stationary functional time series: dimension reduction and regression". Supervisor: Siegfried Hormann (ULB).

11. Coauthors

1. Aboubacar Amiri (Université Lille 3)
2. Jose Ameijeiras-Alonso (University of Santiago de Compostela)
3. Christine Cutting (ULB)
4. Eduardo Garcìa Portuguès (University Carlos III, Madrid)
5. Marc Hallin (Princeton University, ULB)
6. Christophe Ley (Ghent University)
7. Simos Meintanis (Athens University)
8. Davy Paindaveine (ULB)
9. Arthur Pewsey (University of Extremadura)
10. Joséa Rasoafaraniaina (ULB)
11. Camille Sabbah (Université Lille 3)
12. Yvik Swan (Université de Liège)
13. Baba Thiam (Université Lille 3)
14. David Veredas (Vlerick Business School)