



**Christophe Croux, PhD**

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Professor – Speciality: Data Science  
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## EDUCATION

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- 1986-1990    **Diploma in Mathematics, Option Applied Mathematics**  
University of Limburg (LUC), Belgium  
University of Antwerp (UIA), Belgium
- 1993        **PhD degree in Science** (*summa cum laude*)  
University of Antwerp (UIA)  
Promotor: Prof. Dr. P. Rousseeuw

## PROFESSIONAL EXPERIENCE

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- 2019-        **Head of Data Science, Economics and Finance Faculty**  
EDHEC Business School, France.
- 2017-        **Professor of Data Science**, EDHEC Business School, France
- 2007-2017    **Full Professor**, K.U.Leuven
- 2001-2007    **Professor**, K.U.Leuven
- 1995-2001    **Professor**, Université Libre de Bruxelles (ULB)
- 1994-2015    **Part-time professor**, Vrije Universiteit Brussel (VUB)
- 1995-1996    **Part-time professor**, University of Liège
- 1992-1995    **Researcher**, Belgian National Science Foundation
- 1990-1992    **Assistant**, University of Antwerp (UIA) ivision of applied mathematics

## TEACHING EXPERIENCE

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- 1989-1990    Trainee in a secondary school, resulting in a diploma of higher secondary school teacher.

- 1990-1992 As a teaching assistant: exercises in numerical analysis, numerical linear algebra, numerical solutions of differential equations, scientific computing and Fortran at the University of Antwerp (UIA).
- 1993-1996 “Selected Topics in Statistics” to mathematics students University of Antwerp
- 1994-1995 “Introduction to Statistics” to students in behavioral sciences at Vesalius College (VUB).
- 1995-1996 “Algebra” and “Geometry” to physics students at the University of Liège.
- 1994- “Mathematical Statistics II/III” to mathematics students at the Vrije Universiteit Brussel (VUB).
- 1995-2001 “Applied Statistics and Econometrics” to Business School students, “Robust Inference” to Mathematics students, “Microeconometrics”, “Selected Topics in Statistics and Econometrics”, and “Graduate Econometrics I” to economics students at the Université Libre de Bruxelles (ULB).
- 2001-2004 “The General Linear Model and experimental Design” to doctoral students of the department of Business Economics (KULeuven)
- 2001-2005 “Forecasting” to doctoral students and advanced master program students of the department of Business Economics (KULeuven).
- 2001-2011 “Advanced Econometrics” to students of the doctoral program in Business and Economics (KULeuven)..
- 2008- “Advanced Time series Analysis” to students of the doctoral program in Business and Economics.
- 2002 -2017 “Quantitative methods” to bachelor students in Business Economics (KULeuven)
- 2004- 2017 “Business Statistics” to bachelor students in Business Engineering (KULeuven)
- 2017- “Data Mining” for the MSc in Data Analytics and Artificial Intelligence (Edhec Business School)
- 2017- “Time Series Analysis” for the MSc in Data Analytics and Artificial Intelligence (Edhec Business School)
- 2017- “Data Visualization” for the MSc in Financial Markets (Edhec Business School)
- 2018- “Statistical Modeling ” for the MSc in Data Analytics and Artificial Intelligence (Edhec Business School)
- 2018- “Multivariate Analysis and Big Data” for the Pre-Master program (Edhec Business School)

## OTHER COURSES AND LECTURES

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- Lecturer at the Journées d'étude en statistique: Statistique Robuste at Marseille (15-19 October 2012).
- Lecturer at the EDEN doctoral seminar on statistical methods for management research, Leuven (14-16 September 2011).
- Lecturer at the IASC-ERS Summer School on Robust methods for Advanced data Structures, Leuven (September 6-9, 2011).
- Lecturer at tutorial workshop « Robustness: Basic Concepts and Applications », Prague (June 28-27, 2010).
- Given a course in Econometrics for the research department of the Belgian National Bank: regression, panel data, and time series analysis (2007-2008).
- Guest Professor for the course “Statistique Robuste” at the Faculty of Science of the Université de Liège (2007-2008, 2009-2010).
- Given the course “Business Statistics” in the postgraduate program “Business Economics” of the K.U. Leuven (2006-2008) and (2010-2011).
- Guest Professor for a short course on Robust Statistics at the Ecole Nationale de Statistique et de l'Analyse de l'Information (ENSAI), Rennes, France (4-8 February 2002; 29-31 January 2003; 4-6 February 2004; 16-18 January 2006; 18-20 September 2006; 7-9 January 2008).
- As an invited lecturer, I gave 6 lectures on Robust Multivariate Statistics for the 23rd Finnish Summer School on Probability Theory, Lathi, Finland, (4-8 June 2001).
- Given a course in Applied Econometrics for the research department of the Belgian National Bank (2001-2002).
- As an invited lecturer, I gave 4 lectures at the Journées d'étude en statistique: Modèles statistiques pour données qualitatives at Marseille (9-13 October 2000).
- Given a course in Robust Inference for the joint doctoral program in mathematics of the Flemish universities (University of Leuven, December 2002).
- Guest professor for the course “Robust Statistical methods” (University of Leuven 1999).
- Given seminars on design of experiments at the Business Liaisons Centre of the University of Antwerp (UBCA), 1994-1996. Taught the introductory statistics course at the Limburgs Universitair Centrum in their Quality Control program organized for people from industry in 1997 and 1999.

## EDITORIAL ACTIVITIES

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- Co-editor of the Special Issue on “Robust Analysis of Complex Data” for Computational Statistics and Data Analysis, 2011.
- Associate editor of Journal of Multivariate Statistics, 2008-...
- Associate editor of Computational Statistics and Data Analysis, 1998-2007.
- Associate editor of Journal of the American Statistical Association, 2005-2008.
- Performed referee work for many journals, including the Journal of the American Statistical Association, Annals of Statistics and Biometrika.
- Reviewer for Mathematical Reviews, 1996-2004.
- Co-editor of the Special Issue on « Machine Learning and Robust Data Mining » for Computational Statistics and Data Analysis, 2007.

- Co-editor of a Special Issue on Factor Models for the Journal of Econometrics, 2004.

## ORGANIZATION OF SCIENTIFIC MEETINGS

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- Co-Organizer of the IASC-ERS Summer School on Robust methods for Advanced Data Structures, September 6-9, 2011.
- Co-Chair of the 4th International Conference of the ERCIM Working Group on Computing & Statistics (ERCIM 2011), London, December 17-19, 2011.
- Member of the Scientific committee of the International Conference on Robust Statistics, Valladolid, June 27-July 1, 2011.
- Member of the Scientific committee of the 19th International Conference on Computational Statistics, Paris, August 22-27, 2010.
- Member of the Scientific committee of the International Conference on Robust Statistics, Prague, June 28-July 2, 2010.
- Co-organizer of the 17th Annual Meeting of the Belgian Statistical Society, 14-16 October, 2009.
- Co-Organizer of the « Fourth Leuven Statistical Day: Time series and panel data analysis: theory and applications » (with G. Dhaene). KU Leuven, 29 May 2009.
- Member of the Scientific and organization committee of the workshop ROBust Classification and Discrimination with High Dimensional Data (ROBCLA 2006) 25-28 January 2006, Firenze Italy.
- Member of the Scientific and organization committee of the workshop DREaM 2005, Developments in Statistical Methodology: Diagnostics Robustness Exploration and Modeling, Milton Keynes, 30/3 - 2/4, 2005.
- Member of the Scientific committee of the Workshop on Robustness and Statistical Inference in Honour of Victor Yohai, 4-5 October 2006, Madrid, Spain.
- Co-organizer of the workshop Robustness for High-dimensional Data, 5-8 May 2004, Vorau, Austria.
- Co-Organizer of the yearly seminars in Econometrics and Statistics at the Faculty of Economics and Applied Economics from 2002-present.
- Organizer of two Sessions on « Robust Data Mining » at the « 3rd World Conference on Computational Statistics & Data Analysis, » Limassol, Cyprus, 28-31 October 2005.
- Organizer of the invited paper session « Model selection for supervised learning », at the 56th meeting of the International Statistical Institute, 22-29 August, Lisbon, 2007.
- Organizer of the Session « Robust Statistics » at the COMPSTAT 2004 meeting, August 23-27, Prague.
- Member of the Scientific committee of the « International Workshop on Computational and Financial Econometrics, » 20-22 April 2007, Geneva, Switzerland.
- Member of the Scientific committee of International Conferences in Robust Statistics (Vorau 2001-Vancouver 2002-Antwerp 2003-Beijing 2004-Jyvaskyla 2005-Lisbon 2006-Antalya 2008, Parma 2009).
- Member of the Scientific committee of the « Econometrics of Wages » conference of the AEA, Brussels 2002.
- Organizer of the Session « Analyse multivariée robuste » at the Journées de Statistique, 13-17 May 2002, Bruxelles.
- Organizer of the joint seminars in statistics and econometrics at U.L.B. from 1998 to 2002.

- Co-organizer of the « XXème Rencontre Franco-Belge de Statisticiens, Factor Models, » Brussels 1999.
- Member of the organization committee of the European meeting for Young Statisticians, Rotterdam 1995.

## DOCTORAL STUDENTS

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- Ruben Crevits (PhD 2019)
  - Luca Barbaglia (PhD 2018)
  - Peter Reusens (PhD 2016)
  - Ines Wilms (PhD 2016, now assistant professor at Maastricht University)
  - Steffi Frison (PhD 2016)
  - Viktoria Ollerer (PhD 2015)
  - Charles Mathias (PhD 2012, joint with Université Libre de Bruxelles)
  - Jonathan Cornelissen (PhD 2012)
  - Koen Mahieu (PhD 2010)
  - Nicolas Glady (Ph.D. 2008, now professor at ESSEC Business School)
  - Kris Boudt (Ph.D. 2008, now professor at Ghent University)
  - Sarah Gelper (Ph. D. 2008, now assistant professor at TU Eindhoven),
  - Johan Van Kerckhoven (Ph.D. 2008, joint supervision with Gerda Claeskens)
  - Abdelilah Yadine (Ph.D 2006)
  - Aurélie Lemmens (Ph.D. 2006, now associate professor at Erasmus University Rotterdam)
  - Kristel Joossens (Ph. D. 2006)
  - Marc Callens (PhD 2004)
  - Catherine Dehon (PhD 2001, now professor at the Université Libre de Bruxelles)
  - Gentiane Haesbroeck (PhD 1999, now professor at the University of Liège)
- Postdoctoral advisor of Andreas Alfons (2012-2013)
  - Postdoctoral advisor of Ines Wilms (2016-2017)

## RESEARCH GRANTS

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- Research Fund of the K.U. Leuven. Research project GOA/12/014 (co-promotor). « FLEXibel STATistisch modeleren en ROBUuste analyses van geavanceerde data Structuren . » Period 01.10.2011-30.09.2016.
- Research Fund of the K.U. Leuven. F+ fellowship 11/001 (promotor). « Robust groupwise variable selection », Andreas Alfons.
- Strategic Basic Research grant of the agency for innovation by Science and technology, IWT/0991183 (promotor of Jonathan Cornelissen). « New methods for the use of highfrequency data and sustainability scores in portfolio management. » Period 01.10.2009-01.10.2013.
- Fund for Scientific Research Flanders. Research project G.0445.08 (promotor). « Robust and semiparametric estimation of marketing models ». Period 01.01.2008-31.12.2011.



- National bank of Belgium. Research project NB/08/Croux (promotor) « Increasing the predictive power of confidence indicators using selection methods. » Period 01.02.2008-31.05.2009.
- Research Fund of the K.U. Leuven. Research project GOA/2007/04 (co-promotor). « Nonparametric and semiparametric techniques and robust methods in statistical analysis. » Period 01.10.2006-30.09.2011.
- Research assistantship of the Fund for Scientific research Flanders, ASP/07 (promotor of Kris Boudt). « Econometric analysis of outlier-contaminated multivariate time series. » Period 01.10.2006-31.12.2008.
- Fund for Scientific Research Flanders. Research project G.0594.05 (promotor). « Granger causality analysis for high dimensional data with application to European business and consumer surveys ». Period 01.01.2005-31.12.2008.
- Chair of the Steering Committee of the European Science Foundation Network Statistical Analysis of Complex Data with Robust and related Statistical Methods, 2004-2007. This network consists of 10 partners and received 80000 Euro for the organization of network activities.
- Fund for Scientific Research Flanders. Research project G.0385.03 (promotor).
- « Discriminant analysis for two and multiple groups: robustness, classification errors, statistical properties ». Period 01.01.2003-31.12.2006.
- Research Fund of the K.U. Leuven. Research project OT/02/10 (promotor). « Robust discriminant analysis. » Period 01.10.2002-30.09.2006.
- Special doctoral fellowship of the Fund for Scientific research Flanders, BDB02/FWO (promotor of Marc Callens). « Multilevel event history analysis: statistical properties and application. » Period 01.09.2002-31.08.2003.
- Co-Promotor of the « Action de recherche concertée (2000-2004) » entitled « L'économie des Etats et des systèmes électoraux: théorie et études empiriques », Université Libre de Bruxelles.
- Received research grants (Crédit aux chercheurs) from the Fonds National de la Recherche Scientifique (FNRS) in 1996, 1998 and 2000.
- Received many travel grants from the Science Foundation (FWO/FNRS).

## PUBLICATIONS

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### Publications in international refereed journals

1. Croux, K., and Veraverbeke, N. (1990), « Nonparametric Estimators for the Probability of Ruin, » Insurance: Mathematics and Economics, 9, 127-130.
2. Croux, C., and Rousseeuw, P.J. (1992), « A Class of High-Breakdown Scale Estimators Based on Subranges, » Communications in Statistics, Theory and Methods, 21, 1935-1951.
3. Rousseeuw, P.J. and Croux, C. (1993), « Alternatives to the Median Absolute Deviation, » Journal of the American Statistical Association, 88, 1273-1283.
4. Croux, C., Rousseeuw, P.J., and Hossjer, O. (1994), « Generalized S-Estimators, » Journal of the American Statistical Association, 89, 1271-1281.

5. Hossjer, O., Croux, C., and Rousseeuw, P.J. (1994), « Asymptotics of Generalized SEstimators, » *Journal of Multivariate Analysis*, 51, 148-177.
6. Croux, C. (1994), « Efficient High-Breakdown M-Estimators of Scale, » *Statistics and Probability Letters*, 19, 371-379.
7. Rousseeuw, P.J., and Croux, C. (1994), « The Bias of k-step M-estimators, » *Statistics and Probability Letters*, 20, 411-420.
8. Hössjer, O., Rousseeuw, P.J., and Croux, C. (1994), « Asymptotics of the Repeated Median Slope Estimator, » *The Annals of Statistics*, 22, 1478-1501.
9. Hössjer, O., and Croux, C. (1995), « Generalizing Univariate Signed Rank Statistics for Testing and Estimating a Multivariate Location Parameter, » *Journal of Nonparametric Statistics*, 4, 293-308.
10. Rousseeuw, P.J., Croux C., and Hössjer, O. (1995), « Sensitivity Functions and Numerical Analysis of the Repeated Median Slope, » *Computational Statistics*, 10, 71-90.
11. Croux, C., Rousseeuw, P.J., and Van Bael, A. (1996), « Positive-breakdown regression by minimizing nested scale estimators , » *Journal of Statistical Planning and Inference*. 53, 197-235.
12. Hössjer, O., Rousseeuw, P.J., and Croux C. (1996), « Asymptotics of an Estimator of a Robust Spread Functional, » *Statistica Sinica*, 2, 375-388.
13. Croux, C. (1996), « Maximum Deviation Curves for Location Estimators, » *Statistics*, 28, 285-305.
14. Oruc, L., Furac, I., Croux, C., Jakovlevic, M., Kracun, I., Folnegovic, V., and Van Broeckhoven, C. (1996), « Association study between bipolar disorder and candidate genes involved in dopamineserotonin metabolism and GABAergic neurotransmission: a preliminary report, » *Psychiatric Genetics*, 6, 213-217.
15. Croux, C., and Haesbroeck, G. (1997), « An Easy Way to Increase the Finite-Sample Efficiency of the Resampled Minimum Volume Ellipsoid Estimator, » *Computational Statistics and Data Analysis*, 25, 125-141.
16. De Bodt, M., Wuyts, F., Van de Heyning, P., and Croux, C. (1997), « Test-Retest study of the GRBAS scale. The inuence of experience and professional background on perceptual rating attitudes of voice quality, » *Journal of Voice*, 11, 74-80.
17. Heylen, L., Wuyts, F., Mertens, F., De Bodt, M., Pattyn, J., Croux, C., Van de Heyning, P., (1998), « Evaluation of the Vocal Performance of Children Using a Voice Range Pro\_le Index, » *Journal of Speech, Language, and Hearing Research*, 41, 232-238.
18. Croux, C. (1998), « Limit Behavior of the Empirical Inuence Function of the Median, » *Statistics and Probability Letters*, 37, 331-340.

19. Croux, C. (1999), Comment on « Robust Principal Component Analysis for Functional Data, » by Locantore, N., Marron, J.S., Simpson, D.G., Tripoli, N., Zhang, J.T., and Cohen, K.L., *Test*, 1, 41-46.
20. Croux, C., and Haesbroeck, G. (1999), « Influence Function and Efficiency of the Minimum Covariance Determinant Scatter Matrix Estimator, » *Journal of Multivariate Analysis*, 71, 161-190.
21. Croux, C., and Haesbroeck, G. (2000), « Principal Component Analysis based on Robust Estimators of the Covariance or Correlation Matrix: Influence Functions and Efficiencies, » *Biometrika*, 87, 603-618.
22. Croux, C., and Haesbroeck, G. (2001), « Maxbias Curves of Robust Scale Estimators Based on Subranges, » *Metrika*, 53, 101-122.
23. Croux, C., Dehon, C., Rousseeuw, P.J., and Van Aelst, S. (2001), « Robust Estimation of the Conditional Median at elliptical Models, » *Statistics and Probability Letters*, 51, 361-368.
24. Croux, C., Forni, M., and Reichlin, L. (2001), « A Measure of Comovement for Economic Variables: Theory and Empirics, » *Review of Economics and Statistics*, 83, 232-241.
25. Croux, C., and Dehon, C. (2001), « Robust Linear Discriminant Analysis using Sestimators, » *The Canadian Journal of Statistics*, 29, 473-492.
26. Croux, C., and Haesbroeck, G. (2002), « Maxbias curves of Robust Location Estimators based on Subranges, » *Journal of Nonparametric Statistics*, 14, 295-306.
27. Van Loco, J., Elskens, M., Croux, C., and Beernaert, H. (2002), « Linearity of calibration curves: use and misuse of the correlation coefficient, » *Accreditation and Quality Assurance*, 7, 281-285.
28. Croux, C., and Dehon, C. (2002), « Analyse canonique basée sur des estimateurs robustes de la matrice de covariance, » *La Revue de Statistique Appliquée*, 2, 5-26.
29. Croux, C., and Haesbroeck, G. (2002), « A Note on Finite-Sample efficiencies of Estimators for the Minimum Volume Ellipsoid, » *Journal of Statistical Computing and Simulation*, 72, 585-596.
30. Croux, C., Haesbroeck, G. and Rousseeuw, P. (2002), « Location Adjustment for the Minimum Volume Ellipsoid Estimator, » *Statistics and Computing*, 12, 191-200.
31. Croux, C., Flandre, C, and Haesbroeck, G. (2002), « The Breakdown Behavior of the Maximum Likelihood Estimator in the Logistic Regression Model, » *Statistics and Probability Letters*, 60, 377-386.
32. Croux, C., and Van Aelst, C. (2002), discussion of « Nearest Neighbor Variance Estimation (NNVE): Robust Covariance Estimation via Nearest Neighbor Cleaning » by Wang, N., and Raftery, A.E., *The Journal of the American Statistical Association*, 97, 1006-1009.



33. Pison, G., Rousseeuw, P.J., Filzmoser, P., and Croux, C. (2003), « Robust Factor Analysis, » *Journal of Multivariate Analysis*, 84, 145-172.
34. Croux, C. Filzmoser, P., Pison, G., and Rousseeuw, P.J. (2003), Fitting Factor Models by Robust Alternating Regressions, *Statistics and Computing*, 13, 23-36.
35. Filzmoser, P., and Croux, C. (2003), « Dimension reduction of the explanatory variables in multiple linear regression, » *Pliska Studia Mathematica Bulgarica*, 14, 59-70.
36. Croux, C., and Dehon, C. (2003), « Estimators of the Multiple Correlation Coefficient: Local Robustness and Confidence Intervals, » *Statistical Papers*, 44, 315-334.
37. Croux, C., Van Aelst, S., and Dehon, C., (2003), « Bounded Influence Regression using High Breakdown Scatter Matrices, » *The Annals of the Institute of Statistical Mathematics*, 55, 265-285.
38. Croux, C., and Haesbroeck, G. (2003), « Implementing the Bianco and Yohai estimator for Logistic Regression, » *Computational Statistics and Data Analysis*, 44, 273-295.
39. Ollila, E., Oja, H., and Croux, C. (2003), « The Affine Equivariant Sign Covariance Matrix: Asymptotic Behavior and Efficiencies, » *Journal of Multivariate Analysis*, 87, 328-355.
40. Ollila, E., Croux, C., and Oja, H. (2004), « Influence Function and Asymptotic Efficiency of the Affine Equivariant Rank Covariance Matrix, » *Statistica Sinica*, 14, 297-316.
41. Serneels, S, Croux, C., and Van Espen, P. (2004), « Influence Properties of Partial Least Squares Regression, » *Chemometrics and Intelligent Laboratory Systems*, 71, 13-20.
42. Callens, M., and Croux, C. (2004), « Contact and Cooperation in the Belgian Fertility and Family Survey, » *Survey methodology*, 30, 115-124.
43. Croux, C., Renault, E., and Werker, B. (2004), « Guest editorial: Dynamic factor models, » *Journal of Econometrics*, 119, 223-230.
44. Serneels, S., Filzmoser, P., Croux, C., and Van Espen, P.J. (2005), « Robust Continuum Regression, » *Chemometrics and Intelligent Laboratory Systems*, 76 (2), 197-204.
45. Lemmens, A., Croux, C., and Dekimpe, M.G. (2005), « On the predictive content of production surveys: a pan-European study, » *International Journal of Forecasting*, 2, 363-367.
46. Croux, C., and Joossens, K. (2005), « Inleiding tot de Robuuste Statistiek: Elementen van theorie en bedrijfseconomische toepassingen, » *Tijdschrift voor Economie en Management*, 2, 287-310.
47. Croux, C., and Ruiz-Gazen, A. (2005), « High Breakdown Estimators for Principal Components: the Projection-Pursuit Approach Revisited, » *Journal of Multivariate Analysis*, 95, 206-226.

48. Branco, J.A. , Croux, C., Filzmoser, P., and Oliviera, M.R. (2005), « Robust Canonical Correlations: A Comparative Study, » *Computational Statistics*, 20, 203-229.
49. Croux, C., and Callens, M. (2005), « Performance of Likelihood-Based Estimation Methods for Multilevel Binary Regression Models, » *Journal of Statistical Computation and Simulation*, 75(12), 1003-1017.
50. Croux, C., and Joossens, K. (2005), « Inuence of Observations on the Misclassification Probability in Quadratic Discriminant Analysis, » *Journal of Multivariate Analysis*, 96, 384-403.
51. Callens, M., and Croux, C. (2005), « The Impact of Education on Third Births. A Multilevel Discrete-Time Hazard Analysis, », *Journal of Applied Statistics*, 32 (10), 1035-1050.
52. Serneels, S., Croux, C., Filzmoser, P., and Van Espen, P.J. (2005 ), « Partial Robust M-Regression, » *Chemometrics and Intelligent Laboratory Systems*, 79, 55-64.
53. Croux, C., Dhaene, G., and Hoorelbeke, D. (2006), « Testing the Information Matrix Equality with Robust estimators, » *Journal of Statistical Planning and Inference*, 136(10), 3583-3613.
54. Taskinen, S., Croux, C., Kankainen, A., Ollila, E., and Oja, H. (2006), « Canonical Analysis based on Scatter Matrices, *Journal of Multivariate Analysis*, 97(2), 359-384.
55. Lemmens, A., and Croux, C. (2006), « Bagging and Boosting Classification Trees to Predict Churn », *Journal of Marketing Research*, 42, 359-384.
56. Claeskens, C., Croux, C., and Van Kerckhoven, J. (2006), Variable selection for logistic regression using a prediction focussed information criterion, *Biometrics*, 62, 972-979.
57. Croux, C. (2006), Discussion of « Sur une limitation très générale de la dispersion de la médiane » by M. Fréchet, *Journal de la Société Française de Statistique*, 147(2), 45-49.
58. Gelper, S., Lemmens, A., and Croux, C. (2007), « Consumer Sentiment and Consumer Spending: Decomposing the Granger Causal Relationship in the Time Domain, » *Applied Economics*, 39(1), 1-11.
59. Daszykowski, M., Serneels, S., Kaczmarek, K., Van Espen, P., Croux, C., and Walczak, B. (2007), « TOMCAT: a MATLAB toolbox for multivariate calibration techniques, » *Chemometrics and Intelligent Laboratory Systems*, 85(2), 269-277.
60. Gelper, S., and Croux, C. (2007), « Multivariate out-of-sample tests for Granger causality, » *Computational Statistics and Data Analysis*, 51(7), 3319-3329.
61. Croux, C., and Filzmoser, P. (2007), Discussion of « A Survey of Robust Statistics, » by S. Morgenthaler, *Statistical Methods and Applications*, 15, 280-282.
62. Croux, C., and Filzmoser, P. (2007), « Algorithms for Projection Pursuit robust principal component analysis, » , *Chemometrics and Intelligent Laboratory Systems*, 87, 218-225.

63. Lemmens, A., Croux, C., and DeKimpe, M.G. (2007), « Consumer Confidence on Europe: United in Diversity? », *International Journal of Research in Marketing*, 24(2), 113-127.
64. Lorant, V., Croux, C., Scott, W., DeLiège D., Mackenbach, J., and Anseau, M. (2007), « Depression and Socio-Economic Risk Factors : a 7-year Longitudinal Population Study », *British Journal of Psychiatry*, 190(4), 293-298.
65. Croux, C., Joossens, K., and Lemmens, A. (2007), « Trimmed Bagging », *Computational Statistics and Data Analysis*, 52(1), 362-368.
66. Croux, C., Gallopoulos, E., Van Aelst, S., and Zha, H. (2007), « Editorial – Machine Learning and Robust Data Mining », *Computational Statistics and Data Analysis*, 52(1), 151-154.
67. Bramati, M. C., and Croux, C. (2007), « Robust Estimators for the Fixed Effects Panel data Model », *Econometrics Journal*, 10(3), 521-540.
68. Claeskens, G., Croux, C., and Van Kerckhoven, J. (2007), « Prediction Focused Model Selection for Autoregressive Models », *Australian and New Zealand Journal of Statistics*, 49(4), 359-379.
69. Croux, C., Filzmoser, P., and Joossens, K. (2008), « Classification Efficiencies for Robust Linear Discriminant Analysis », *Statistica Sinica*, 18(2), 581-599.
70. Agullo, J., Croux, C., and Van Aelst, S. (2008), « The Multivariate Least Trimmed Squares Estimator », *Journal of Multivariate Analysis*, 99(3), 311-318.
71. Croux, C., Haesbroeck, G., and Joossens, K. (2008), « Logistic Discrimination using Robust Estimators: an Influence Function Approach », *The Canadian Journal of Statistics*, 36(2), 157-174.
72. Croux, C., Gelper, S., and Fried, R. (2008), « Computational aspects of robust Holt-Winters smoothing based on M-Estimation », *Applications in Mathematics*, 53(3), 163-176.
73. Claeskens, G., Croux, C., and Van Kerckhoven, J. (2008), « An Information Criterion for Variable Selection in Support Vector Machines », *Journal of Machine Learning Research*, 9, 541-558
74. Lemmens, A., Croux, C., and Dekimpe, M.G. (2008), « Measuring and Testing Granger Causality over the Spectrum: An application to European Production Expectation Surveys », *International Journal of Forecasting*, 24(3), 414-431.
75. Boudt, K., Peterson, B., and Croux, C. (2008), « Estimation and Decomposition of Downside Risk for Portfolios with Non-normal Returns », *The Journal of Risk*, 11(2), 1-25.
76. Glady, N., Baesens, B., and Croux, C. (2009), « A Modified Pareto/NBD Approach for Predicting Customer Lifetime Value », *Expert Systems With Applications*, 36, 2062-2071.

77. Glady, N., and Croux, C. (2009), « Predicting Customer Wallet without Survey Data, » *Journal of Service Research*, 11(3), 219-231.
78. Gelper, S., Schettlinger, K., Croux, C., Gather, U. (2009), « Robust Online Scale Estimation in Time Series: A Model-Free Approach », *Journal of Statistical Planning & Inference*, 139, 335-339.
79. Glady, N., Baesens, B., and Croux, C. (2009), « Modeling Churn Using Customer Lifetime Value, » *European Journal of Operational Research*, 197(1), 402-411.
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## PRESENTATIONS AT SCIENTIFIC MEETINGS

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8. Croux C. (1994), « Robust Methods for estimating and testing a multivariate location parameter, » seminar at the University of Limburg (Belgium), 25 May.
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47. Croux, C. (2001), « Robust Principal Components using Projection-Pursuit, » Workshop on non-parametric Statistics, University of Bern, 17-20 July.
48. Croux, C. (2001), « Projection-Pursuit based Robust Multivariate Statistics, » ICORS 2001, International Conference on Robust Statistics, Voralpe (Austria), 23-27 July.
49. Croux, C. (2001), « Robust Principal Components using Projection-Pursuit, » The 53rd Session of the International Statistical Institute, Seoul (Korea), 22-29 August.
50. Croux, C. (2001), « Projection-Pursuit techniques for Multivariate Data Analysis, » Statistics Seminar, Université Catholique de Louvain, 19 October.
51. Croux, C. (2001), « A Robust R<sup>2</sup> measure, » Econometrics Seminar, K.U. Leuven, 13 November.
52. Croux, C., and Haesbroeck, G. (2002), « On the Bianco-Yohai Estimator for High Breakdown Logistic Regression, » Second International Conference in Robust Statistics, Vancouver, 12-18 May.
53. Croux, C., E. Ollila, H. Oja (2002), « Covariance Matrix Estimation based on Spatial Signs, » 4th International Conference on Statistical Data Analysis based on the L<sub>1</sub>-norm and related Methods, Neuchatel, Switzerland, 4-9 August.
54. Croux, C. (2002), « Optimal multivariate S-estimators, » 24th European Meeting of Statisticians, Prague, 19-23 August.
55. Croux, C. (2002), « On M-type Estimators for Logistic Regression, » Second Prague-Brussels Statistics Seminar, Prague, 24 August.
56. Croux, C. (2002), « Covariance Matrix estimation based on Spatial Signs », Seminar at the department of mathematics, Liège, 15 November.
57. Croux, C., and Laine B. (2003), « Robust Subspace Estimation, » Third International Conference in Robust Statistics, Antwerp, 13-18 July.
58. Croux, C., and Joossens, K. (2003), « Diagnostics for Quadratic Discriminant Analysis, » Joint Statistical Meetings of the American Statistical Association, San Francisco, 3-7 August.
59. Croux, C., and Joossens, K. (2003), « Robust Diagnostics for Quadratic Discriminant Analysis, » Seminar at the Technical University Vienna, 15 September.
60. Croux, C. and Joossens, K. (2003), « Robust Linear and Quadratic Discriminant Analysis, » CLADAG 2003, meeting of the Italian Classification Society, 22-24 September.

61. Croux, C. (2003), « Robust Estimation of the Principal Components Subspace , » Seminar at Université Paul Sabatier, Toulouse, 3 November.
62. Croux, C. (2003), « Robust Estimation of the Principal Components Subspace, » Seminar at Dept. of Statistics, Michigan State University, 2 December.
63. Croux, C. (2004), « Discussion: Mathematical statistics for high dimension low sample size data, by S. Marron », Workshop on Robustness for High-dimensional Data, Vorau, 5-8 May.
64. Croux, C. (2004), « Robust Standard Errors for Robust Estimators, » seminar at the University of Dortmund, 27 May.
65. Croux, C. (2004), « Robust Principal Components Analysis and Singular Value Decomposition, » seminar at the BanInternational Research Center (Canada), 9 June.
66. Croux, C. (2004), « Robust Standard Errors for Robust Estimators, » seminar at the BanInternational Research Center (Canada), 17 June.
67. Croux, C. (2004), « Discussion: Computational Aspects of Robust Statistical Methods, » COMPSTAT 2004, 16th Symposium of the IASC, Prague, 23-27 August.
68. Croux, C. (2004), « Granger Causality Analysis for Business and Consumer Surveys, » 12th Annual Meeting of the Belgian Statistical Society, 8-9 October.
69. Croux, C. (2004), « Robust Standard Errors for Robust Estimators, » seminar at the University of Geneva, 10 December.
70. Croux, C. (2005), « Discussion: The PLS-Approach in Data Analysis, » 55th Session of the International Statistical Institute, Sidney, 5-12 April.
71. Croux, C. (2005), « Discussion: Asymptotics: applicable and non-applicable, by L. Davies », Francqui Foundation Workshop, Brussels, 12-13 May.
72. Croux, C. (2005), « Heteroscedastic and autocorrelation consistent estimators of standard errors in robust regression, » Workshop on Nonparametric Statistical Methods, University of Tampere, June 8-10.
73. Croux, C., Haesbroeck, G., and Joossens, K. (2005), « Influence Analysis of Error Rates: Logistic Discrimination, » International Conference on Robust Statistics, Jyväskylä (Finland) 12-17 June.
74. Croux, C. (2005), « A Robust Approach to Partial Least Squares, » 3rd World Conference on Computational Statistics & Data Analysis, Limassol, Cyprus, 28-31 October.
75. Croux, C. (2005), « Robust Discriminant Analysis: Error rate, Influence Function, Efficiency, » Second Regional Meeting in Probability and Mathematical Statistics, Buenos Aires, 28-30 November.
76. Croux, C. (2005), « Granger Causality Analysis for Business and Consumer Surveys, » seminar at the University of Buenos Aires, 1 December.

77. Croux, C. (2006), « Granger Causality Analysis for Business and Consumer Surveys, » seminar at the ENSAI, Rennes, 20 January.
78. Croux, C. (2006), « Robust Discriminant Analysis: Influence Functions and Classification Efficiencies, » ROBLCA workshop, Florence (Italy), 26 January.
79. Croux, C. (2006), « Granger Causality Analysis for Business and Consumer Surveys, » seminar at the University of Antwerp, 23 February.
80. Croux, C. (2006), « A Robust Estimator for the Vector Autoregressive Model, » Workshop on Robust methods for Power System State Estimation and Load Forecasting-State of the Art and Prospects, 29-30 May.
81. Croux, C. (2006), « Classification Efficiencies for Robust Discrimination, » 9th International Vilnius Conference on Probability Theory and Mathematical Statistics., Vilnius, 25-30 June.
82. Croux, C. (2006), « Are Good leverage Points Good or Bad? », International Conference on Robust Statistics, Lisbon, 16-21 July.
83. Croux, C. (2006), « Robust subspace estimation based on trimmed squared loss, » seminar at the University of Valladolid, 2 October.
84. Croux, C. (2006), « Standard errors for MM-estimators in presence of heteroscedasticity and serial correlation, » Workshop on Robustness and Statistical Inference in Honor of Victor Yohai, Madrid, 4-5 October.
85. Croux, C. (2006), « Robust Standard Errors for Robust estimators, » seminar at the Université Libre de Bruxelles, 16 November.
86. Croux, C. (2006), « Robust Standard Errors for Robust estimators, » seminar at the Université of Lausanne, 7 December.
87. Croux, C. (2006), « Robust Discrimination: an influence function approach, » Swiss Statistics Seminars, University of Bern, 8 December.
88. Croux, C. (2007), « Robust Standard Errors for Robust Regression Estimators, » seminar at the Erasmus Universiteit Rotterdam, 29 March.
89. Croux, C. (2007), « Robust Discrimination: an influence function approach, » Joint VOC and BNVKI meeting on data mining, Utrecht, 27 April.
90. Croux, C., Lemmens, A., Dekimpe, M. (2007) « Testing for Granger Causality in the frequency domain, » International Workshop on Computational and Financial Econometrics, Geneva, April 20-22.
91. Croux, C. (2007), « Discussion: model selection for supervised learning, » 56th session of the International Statistical Institute, August 22-29.

92. Croux, C., Gelper, S., and Fried, R. (2007), « Robust Forecasting with Exponential and Holt-Winters Smoothing, » Workshop on nonparametric statistical inference, Hejnice, Czech Republic, September 1-6.
93. Croux, C., Gelper, S., and Fried, R. (2007), « Robust Forecasting with Exponential and Holt-Winters Smoothing, » International Conference on Robust Statistics, Buenos Aires, 17-21 September.
94. Croux, C. (2007), « Robust Standard Errors for Robust Regression Estimators, » seminar at the University of Tilburg, October 24.
95. Croux, C. (2007), « Robust R-squared for MM-estimators, » International Workshop on Robust Statistics and R, Banf, Canada, October 28 - November 2.
96. Gelper, S., and Croux, C. (2007), « Robust forecasting with Holt-Winters smoothing, » Seminar at the Institut de Statistique, Université Catholique de Louvain, December 14.
97. Croux, C., and Gelper, S. (2008), « Robust online estimation of scale, » Seminar at the university of Neuchâtel, May 28.
98. Croux, C., and Gelper, S. (2008), « Variable selection for time series forecasting using the groupwise LARS algorithm, » 2nd International Workshop on Computational and Financial Econometrics (CFE'08), Neuchâtel, June 19-21.
99. Croux, C., and Boudt, K. (2008), « Robust estimation of multivariate GARCH models, » Second Brussels-Waseda Seminar on Time Series and Financial Statistics, Brussels, June 23-24.
100. Croux, C., and Joossens, K. (2008), « Robust Estimation of the Vector Autoregressive Model by a Least Trimmed Squares procedure, » International Conference on Computational Statistics, Porto, August 24-29.
101. Croux, C., and Boudt, K. (2008), « Outlyingness weighted quadratic covariation, » International Conference on Robust Statistics, Antalya (Turkey), September 8 – 12
102. Croux, C., and Glady, N. (2008), « Predicting Customer Wallet without Survey data, » Marketing Winter Camp, K.U.Leuven, December 12.
103. Croux, C., and Glady, N. (2008), « Predicting Customer Wallet without Survey data, » Seminar at HEC Paris, January 29.
104. Croux, C. (2009), « Modeling Dependencies in Customer Lifetime Value with Copulas, » Seminar at Tilburg University, February 3.
105. Croux, C. (2009), “Classification Efficiencies for Robust Discriminant Analysis”, Seminar at Delft University, April 1.
106. Croux, C. (2009), « Maxbias Curves for Multivariate Regression Estimators, » Invited Speaker at the International Conference on Robust Statistics, Parma, June 14-19.

107. Croux, C. (2009), Discussant of the session on « Robust Statistics, » at the « HECStatistics and Finance » conference, Paris, October 2.
108. Croux, C. (2009), Keynote speaker at the 3rd International Conference on Computational and Financial Econometrics (CFE'09), Limassol (Cyprus) October 29-31.
109. Croux, C., and Dehon, C. (2009), « Robustness properties of some nonparametric correlation measures », invited speaker at the Nonparametric statistics and time series models, conference in honour of Prof. Marc Hallin, Academie Royale de Belgique, November 27-29.
110. Croux, C. (2010), « Robust multivariate scale estimation, » Seminar at Dortmund University, January 12.
111. Croux, C., Gladys, N., and Lemmens, A. (2010), « Modeling Within- and Across Customer Association in Lifetime Value with Copulas, » Seminar at Essec Business School, Paris (France), January 15.
112. Croux, C., and Dehon, C. (2010), « Robustness properties of some nonparametric correlation measures, » Toulouse School of Economics, May 18.
113. Croux, C., and Dehon, C. (2010), « Robustness and efficiency of the Spearman and Kendall correlation measures, » 3rd International Conference of the ERCIM Working Group on Computing & Statistics (ERCIM 2010), » London, December 10-12.
114. Croux, C. (2011), « Sparse and Robust Covariance Matrix estimation, » Seminar at University of Geneva, April 8.
115. Croux, C. (2011), « Sparse and Robust Covariance Matrix estimation, » Seminar at the University of Lille, November 24.
116. Croux, C., and Gelper, S. (2011), « Time series least angle regression for selecting predictive economic sentiment series », 5th International Conference on Computational and Financial Econometrics (CFE 2011), » London, December 17-19.
117. Croux, C. (2011), « Robust Sparse Principal Component Analysis », Seminar at Erasmus University Rotterdam, December 13.
118. Croux, C. (2012), « Robust Sparse Principal Component Analysis », Workshop Robust Methods for Dependent Data, Witten (Germany), 26-29 February 2012.
119. Croux, C. (2012), « The Robust Maximum Correlation Estimator », Conference 20 Years ECARES, Brussels, 19 May 2012.
120. Croux, C. (2012), « Robust and sparse factor modelling », 32nd International Symposium on Forecasting, Boston, 24-27 June.
121. Croux, C. (2012), « Robust estimation of mean and dispersion functions in extended generalized additive models », First International Conference on Nonparametric Statistics, Chalkidiki, 15-19 June.



122. Croux, C. (2012), « Robust regularized estimation in multivariate statistics » International Conference on Robust Statistics, Vermont, 5-10 August.
123. Croux, C. (2012), « Sparse estimation of Vector Autoregressive Models », 20th International Conference on Computational Statistics, Limassol, 27-31 August.
124. Croux, C. (2012), « Sparse estimation of Vector Autoregressive Models», Workshop on modern nonparametric methods for time series, reliability, and optimization, Leuven, 10-12 September.
125. Croux, C. (2013), « Robust regularized estimation in multivariate statistics » MiniWorkshop on Robust Statistics, Helsinki, 20 June.
126. Croux, C. and C. Fuzz (2013) « New measures of competitiveness », 7th COMPNET Workshop, European central Bank, Frankfurt, 12-13 December.
127. Croux, C. (2013), « Robust regularized estimation in multivariate statistics, » Invited speaker at the 6th International Conference of the ERCIM Working Group on Computing & Statistics (ERCIM 2013), » London, December 14-16.
128. Croux, C. (2014) « Robust Sparse Canonical Correlation Analysis », Invited speaker at the 25th Nordic Conference in Mathematical Statistics, Turku (Finland), 2-6 June.
129. Croux, C. (2014) « Robust Sparse Canonical Correlation Analysis », International Conference on Robust Statistics, Halle-Wittenberg (Germany), 10-15 August.
130. Croux C. and Wilms, I. (2014) « Sparse cointegration analysis in high dimensions » LSM/CORE Seminar, Louvain, 29 September.
131. Croux, C. (2014), « Sparse cointegration analysis in high dimensions » Nu\_eld Econometric/Inet Seminar, Oxford, 14 November.
132. Croux C. and Wilms I. (2014), « Sparse cointegration analysis in high dimension, » 2<sup>nd</sup> IAP StuDys workshop, Université libre de Bruxelles (Belgium), 24 November.
133. Croux, C. and Ollerer, V. (2015) « Robust and sparse estimation of inverse covariance matrices in presence of cell-wise contamination », Invited Speaker at the International Conference on Robust Statistics, Kolkata, 11-16 January.
134. Croux, C. (2015), « Robust Statistics and time series modeling (Ana Timberlake memorial lecture) », Invited Speaker at the OxMetrics User Conference, Aix-en-provence, September 3-4.
135. Croux, C. (2015), « Sparse cointegration, » Econometrics, Finance and Monetary Economics seminar series, Maastricht, 29 October.
136. Croux, C. (2015), « Robust and sparse regression in high dimensions, « Workshop: Present and Future Challenges in Robust Statistics, Banff (Canada), 16-20 November.

137. Croux, C. (2015), «The robust lasso for high dimensional regression, », Invited speaker at the 9th International Conference on Computational and Financial Econometrics, London, December 12-14.
138. Croux, C. (2016), « The robust lasso for high dimensional regression», seminar at TU Wien, April 25.
139. Croux, C., and Ines Wilms (2016), «Sparse Cointegration, » seminar at ESSEC Business School, Paris, June 1.
140. Croux, C. and Crevits, R. (2016), « Robust forecasting of short time series », Invited Speaker at the International Conference on Robust Statistics, Geneva, 4-8 July.
141. Croux, C. (2016), «Robust and sparse estimation in multivariate statistics», Invited Speaker at the 9th International Conference of the ERCIM WG on Computational and Methodological Statistics, Sevilla, 9-11 December.
142. Croux, C. (2016), «Exploring dependencies in a High dimensional time series», Invited Speaker at the 24th Annual meeting of the Belgian Statistical Society, Namur, Belgium, 12-14 October.
143. Croux, C. (2016), «Exploring dependencies in a High dimensional time series», Invited Speaker at the Leuven Statistics Days, Leuven, Belgium, 20-21 October.
144. Croux, C. (2017), «Exploring dependencies in a High dimensional time series», Seminar at KAUST University (Saudi Arabia), April 13.
145. Croux, C. (2017), «Sparse Multi-Class estimation», Seminar at the University of Liege, December 21.
146. Croux, C. (2018), «Sparse Vector Autoregressive Models», Invited Speaker at the Workshop: Frontiers in Forecasting, Minneapolis, 21-23 February.
147. Croux, C. (2018), «Sparse Vector Autoregressive Models», CREST Financial Econometrics Seminar, Paris, May 24.
148. Croux, C. (2018), « Multi-class vector autoregressive models», DSSV 2018: data science, statistics, visualization, Vienna, 9-11 July.
149. Croux, C. (2018), « Sparse Vector Autoregressive Models: Applications », Tinbergen econometrics seminar, Amsterdam, September 21.
150. Croux, C. (2018), « Multiclass vector auto-regressive models for multistore sales data », Economics Seminar, Namur, September 25.
151. Croux, C. (2018), « HAC standard errors for robust estimators », Invited Speaker at the CFE-CMStatistics 2018, Pisa, 14-16 December.

## RESEARCH INTERESTS

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Forecasting; big data; multivariate statistics; marketing modeling; applied econometrics; computational statistics; robust statistics. The application and implementation of the proposed methodology is an essential part of my research.

## MISCELLANEA

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- President of the Scientific committee SEN2 of the Fonds National de Recherche Scientifique (FNRS Belgium), (2016-..)
- Member of the council (Treasurer) of the International Association for Statistical Computing (2011-2013).
- Elected Member of the board of directors of the International Association for Statistical Computing, European Regional Section (2008-2012).
- Stayed as a visitor at several universities: Paris, Université Paris VI (1/4/90-1/6/90); Lund, Institute of Technology (30/04/94-8/05/94); Toulouse, Institut Paul Sabatier (17/5/95-17/7/95); Vienna, Technical University (21/7/99-31/7/99); Lisbon, Technical University (26/11/00-02/12/00); University of Jyvaskyla (15/2/2001-21/2/2001), Vienna, Technical University (15/9/2004-21/9/2004); Université des Sciences Sociales, Toulouse (3/11/2004-9/11/2004), Michigan State University (17/11/2004-14/12/2004).
- Elected member of the International Statistical Institute (ISI).
- Good knowledge of several statistical software packages: R, S-plus, SPSS, Gauss, Eviews, Matlab,...
- Performed statistical consulting for industrial and medical projects.

## LANGUAGES

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Native language is Dutch. Good knowledge of French and English. Passive knowledge of German.