Andreas Alfons

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Curriculum Vitae

Academic and research positions

2018 – present	**Erasmus University Rotterdam**, Erasmus School of Economics Associate Professor, Econometric Institute
2013 – 2018	**Erasmus University Rotterdam**, Erasmus School of Economics Assistant Professor, Econometric Institute
2011 – 2013	**KU Leuven**, Faculty of Business and Economics Postdoctoral research fellow, Research Centre for Operations Research and Statistics
2009	**United Nations Industrial Development Organization** Expert on programming and statistics, Research and Statistics Branch

Education

2008 – 2010	**Vienna University of Technology** PhD in *Statistics* under advisor Peter Filzmoser
2001 – 2008	**Vienna University of Technology** MSc in *Technical Mathematics*, specialization on *Mathematical Computer Science*
2005 – 2006	**University of Groningen** Exchange student in *Mathematics and Computer Science* with the Erasmus program

Research interests

- Robust statistical methods and outlier detection for complex data
- Robust methods for statistical learning with an emphasis on high-dimensional data
- Applications of robust statistics in the social and behavioral sciences
- Development of statistical software

Grants

NWO Vidi grant: Robust analysis of (big) rating-scale data in the social sciences (€800,000.-)

International peer-reviewed journals

A. Alfons, N.Y. Ates and P.J.F. Groenen (2021). A robust bootstrap test for mediation analysis. *Organizational Research Methods.* DOI 10.1177/1094428121999096.

N. Štefelová, A. Alfons, J. Palarea, P. Filzmoser and K. Hron (2021). Robust regression on compositional covariates including cell-wise outliers. *Advances in Data Analysis and Classification.* DOI 10.1007/s11634-021-00436-9.

A. Alfons, C. Croux and P. Filzmoser (2017). Robust maximum association estimators. *Journal of the American Statistical Association*, 112(517), 436–445.

V. Öllerer, A. Alfons and C. Croux (2016). The shooting S-estimator for robust regression. *Computational Statistics*, 31(3), 829–844.

A. Alfons, C. Croux and P. Filzmoser (2016). Robust maximum association between data sets: The R package ccaPP. *Austrian Journal of Statistics*, 45(1): 71–79.

A. Alfons, C. Croux and S. Gelper (2016). Robust groupwise least angle regression. *Computational Statistics & Data Analysis*, 93: 421–435.

V. Öllerer, C. Croux and A. Alfons (2015). The influence function of penalized regression estimators. *Statistics: A Journal of Theoretical and Applied Statistics*, 49(4): 741–765.

A. Alfons and M. Templ (2013). Estimation of social exclusion indicators from complex surveys: The R package laeken. *Journal of Statistical Software*, 54(15): 1–25.

A. Alfons, C. Croux and S. Gelper (2013). Sparse least trimmed squares regression for analyzing high-dimensional large data sets. *The Annals of Applied Statistics*, 7(1): 226–248.

A. Alfons, M. Templ and P. Filzmoser (2013). Robust estimation of economic indicators from survey samples based on Pareto tail modeling. *Journal of the Royal Statistical Society, Series C*, 62(2): 271–286.

M. Templ, A. Alfons and P. Filzmoser (2012). Exploring incomplete data using visualization techniques. *Advances in Data Analysis and Classification*, 6(1): 29–47.

A. Alfons, S. Kraft, M. Templ and P. Filzmoser (2011). Simulation of close-to-reality population data for household surveys with application to EU-SILC. *Statistical Methods & Applications*, 20(3): 383–407.

A. Alfons, W.E. Baaske, P. Filzmoser, W. Mader and R. Wieser (2011). Robust variable selection with application to quality of life research. *Statistical Methods & Applications*, 20(1):65–82.

A. Alfons, M. Templ and P. Filzmoser (2010). An object-oriented framework for statistical simulation: The R package simFrame. *Journal of Statistical Software*, 37(3):1–36.

Peer-reviewed conference proceedings

A. Alfons, M. Templ, P. Filzmoser and J. Holzer (2010). A comparison of robust methods for Pareto tail modeling in the case of Laeken indicators. In C. Borgelt, G. González-Rodríguez, W. Trutschnig, M.A. Lubiano, M.A. Gil, P. Grzegorzewski, and O. Hryniewicz, editors, *Combining Soft Computing and Statistical Methods in Data Analysis*, volume 77 of *Advances in Intelligent and Soft Computing*, pages 17–24. Springer, Heidelberg. ISBN 978-3-642-14745-6.

M. Templ and A. Alfons (2010). Disclosure risk of synthetic population data with application in the case of EU-SILC. In J. Domingo-Ferrer and E. Magkos, editors, *Privacy in Statistical Databases*, volume 6344 of *Lecture Notes in Computer Science*, pages 174–186. Springer, Heidelberg. ISBN 978-3-642-15837-7.

A. Alfons, M. Templ and P. Filzmoser (2010). Contamination models in the R package simFrame for statistical simulation. In S. Aivazian, P. Filzmoser, and Y. Kharin, editors, *Computer Data Analysis and Modeling: Complex Stochastic Data and Systems*, volume 2, pages 178–181, Minsk. ISBN 978-985-476-848-9.

Software

A. Alfons. ***ccaPP: (Robust) Canonical Correlation Analysis via Projection Pursuit***. R package. http://CRAN.R-project.org/package=ccaPP

A. Alfons, J. Holzer, and M. Templ. ***laeken***: *Estimation of Indicators on Social Exclusion and Poverty*. R package. http://CRAN.R-project.org/package=laeken

A. Alfons and N. Štefelovà. **lmcrCoda**: Cellwise and rowwise robust linear regression with compositional covariates. Collection of R functions. https://github.com/aalfons/lmcrCoda

A. Alfons. ***perry***: *Resampling-based prediction error estimation for regression models*. R package. http://CRAN.R-project.org/package=perry

A. Alfons. **robmed**: *(Robust) Mediation Analysis*. http://CRAN.R-project.org/package=robmed

A. Alfons. **ROBMED**: *A robust bootstrap test for mediation analysis*. SPSS R extension bundle. https://github.com/aalfons/ROBMED-RSPSS

A. Alfons. **robustHD**: *Robust Methods for High-Dimensional Data*. R package. http://CRAN.R-project.org/package=robustHD

A. Alfons. **simFrame**: *Simulation framework*. R package. http://CRAN.R-project.org/package=simFrame

M. Templ, A. Kowarik, B.Meindl and A. Alfons. **simPop**: *Simulation of Complex Synthetic Data Information*. R package. http://CRAN.R-project.org/package=simPop

M. Templ, A. Kowarik, A. Alfons and G. de Cillia. **VIM**: *Visualization and Imputation of Missing Values*. R package. http://CRAN.R-project.org/package=VIM

Books

A. Alfons (2011). Simulation and Robust Statistics: Application to Laeken Indicators and Quality of Life Research. Südwestdeutscher Verlag für Hochschulschriften, Saarbrücken. ISBN 978-3-8381-2706-4.

Presentations

Seminars

A. Alfons. *A projection pursuit approach for robust maximum association measures with an extension for sparsity*. Statistics seminar, Université catholique de Louvain, November 15, 2019, Louvain-la-Neuve, Belgium.

A. Alfons. *A projection pursuit algorithm for robust maximum association estimators with an extension for sparsity*. Applied statistics seminar, Palacký University Olomouc, April 9, 2013, Olomouc, Czech Republic.

A. Alfons. *Robustification of the lasso: sparse least trimmed squares regression*. Statistics seminar, Université libre de Bruxelles, October 5, 2012, Brussels, Belgium.

A. Alfons. *Robust linear model selection based on L_1 penalization and least angle regression*. Econometrics seminar, Erasmus University Rotterdam, October 2, 2012, Rotterdam, The Netherlands.

A. Alfons. *A robust variant of the lasso: sparse least trimmed squares regression*. Statistics and Econometrics Seminar, KU Leuven, February 23, 2012, Leuven, Belgium.

Conferences

N. Štefelová, A. Alfons, J. Palarea-Albaladejo, P. Filzmoser, K. Hron. Cellwise and rowwise robust regression with compositional covariates. Data Science, Statistics & Visualisation (DSSV) Conference, July 29-31, 2020, Duke University (online). **Invited talk**.

A. Alfons, N.Y. Ates, P.J.F. Groenen. *Robust mediation analysis using the R package robmed*. useR! The R User Conference, July 9-12, 2019, Toulouse, France.

A. Alfons, N.Y. Ates, P.J.F. Groenen. *Mediation analysis via the fast and robust boostrap*. International Conference on Robust Statistics, May 28-31, 2019, Guayaquil, Ecuador.

A. Alfons, C. Croux, P. Filzmoser. *Robust sparse maximum association estimators*. 23nrd International Conference on Computational Statistics, August 28-31, 2018, Iasi, Romania.

A. Alfons, C. Croux, V. Öllerer. *Sparse S- and MM-estimation for high-dimensional regression.* 22nd International Conference on Computational Statistics, August 23–26, 2016, Oviedo, Spain.

A. Alfons, V. Öllerer, C. Croux. *Robust regression in high dimensions: sparse S- and MM-estimation*. 8th International Conference of the ERCIM Working Group on Computational and Methodological Statistics, December 12–14, 2015, London, UK.

A. Alfons, C. Croux, V. Öllerer, S. Gelper. *Algorithms for robust regression and variable selection in high-dimensional settings.* 60th ISI World Statistics Congress, July 26–31, 2015, Rio de Janeiro, Brazil.

A. Alfons, C. Croux, S. Gelper. *A robust extension of least angle regression for groupwise variable selection.* Olomoucian Days of Applied Mathematics, May 20–22, 2015, Olomouc, Czech Republic.

A. Alfons, V. Öllerer, C. Croux. *A first step towards robust regression under elementwise contamination.* 7th International Conference of the ERCIM Working Group on Computational and Methodological Statistics, December 6–8, 2014, Pisa, Italy.

A. Alfons, C. Croux, S. Gelper. *An algorithm for robust groupwise least angle regression.* 21st International Conference on Computational Statistics, August 19–22, 2014, Geneva, Switzerland.

A. Alfons. *Robust model selection: New developments in the R package robustHD.* useR! The R User Conference, June 30–July 3, 2014, Los Angeles, California, USA.

A. Alfons, C. Croux, and P. Filzmoser. *Robust maximum association estimators and an extension for sparsity.* 6th International Conference of the ERCIM Working Group on Computional and Methodological Statistics, December 14–16, 2013, London, UK. **Invited talk**.

A. Alfons, C. Croux, V. Öllerer, S. Gelper. *Robust sparse regression in high dimensions.* 59th ISI World Statistics Congress, August 25–30, 2013, Hong Kong, China.

A. Alfons. *Robust model selection for high-dimensional data with the R package robustHD.* useR! The R User Conference, July 10–12, 2013, Albacete, Spain.

A. Alfons, C. Croux, and P. Filzmoser. *Robust maximum association estimators.* 8th Meeting of the Netherlands Econometric Study Group, June 15, 2013, Amsterdam, The Netherlands.

A. Alfons, C. Croux, and P. Filzmoser. *A projection-pursuit algorithm for robust maximum correlation estimators.* Statistische Woche, September 18–21, 2012, Vienna, Austria.

A. Alfons. *Model selection for high-dimensional data using the R package robustHD.* 20th International Conference on Computational Statistics, August 27–31, 2012, Limassol, Cyprus.

A. Alfons, C. Croux, and P. Filzmoser. *Robust maximum correlation based on projection pursuit.* International Conference on Robust Statistics, August 5–10, 2012, Burlington, Vermont, USA.

A. Alfons, C. Croux, and S. Gelper. *Robust high-dimensional regression: sparse least trimmed squares.* Joint Statistical Meetings, July 28–August 2, 2012, San Diego, California, USA.

A. Alfons. *A toolkit for cross-validation: The R package cvTools.* useR! The 8th International R User Conference, June 12–15, 2012, Nashville, Tennessee, USA.

A. Alfons, C. Croux, and S. Gelper. *The sparse least trimmed squares estimator for simultaneous robust regression and model selection.* 1st Joint Conference of the Belgian, Royal Spanish and Luxembourg Mathematical Societies, June 6–8, 2012, Liège, Belgium.

A. Alfons, C. Croux, and S. Gelper. *Robust regression and model selection: sparse least trimmed squares.* 4th International Conference of the ERCIM Working Group on Computing & Statistics, December 17–19, 2011, London, UK. **Invited talk**.

A. Alfons, C. Croux, and S. Gelper. *Robust model selection with with grouped variables.* International Conference on Robust Statistics, June 27–July 1, 2011, Valladolid, Spain.

A. Alfons and P. Filzmoser. *Robust variable selection with application in the social sciences.* Dutch/Flemish Classification Society Spring Meeting, May 13, 2011, Antwerp, Belgium. **Invited talk**.

A. Alfons, M. Templ, and P. Filzmoser. *Robust estimation of social inclusion indicators based on Pareto tail modeling.* New Techniques and Technologies for Statistics, February 22–24, 2011, Brussels, Belgium.

A. Alfons and P. Filzmoser. *Robust model selection in the social sciences.* 3rd International Workshop of the ERCIM Working Group on Computing & Statistics, December 10–12, 2010, London, UK. **Invited talk**.

A. Alfons, M. Templ, P. Filzmoser, and J. Holzer. *A comparison of robust methods for Pareto tail modeling in the case of Laeken indicators*. 5th International Conference on Soft Methods in Probability and Statistics, September 28–October 1, 2010, Oviedo and Mieres, Spain.

A. Alfons, M. Templ, and P. Filzmoser. *Contamination models in the R package simFrame for statistical simulation*. 9th International Conference Computer Data Analysis and Modeling, September 7–11, 2010, Minsk, Belarus.

A. Alfons, M. Templ, and P. Filzmoser. *The R package simFrame: An object-oriented approach towards simulation studies in statistics*. useR! The R User Conference, July 20–23, 2010, Gaithersburg, Maryland, USA.

R. Dutter, A. Zainzinger, and A. Alfons. *DAS+R: A graphical user interface for multivariate data analysis in R*. Chemometrics Workshop, June 28, 2010, Vienna, Austria.

A. Alfons, M. Templ, and P. Filzmoser. *Exploring microdata with missing information*. Workshop on Exploratory Data Analysis and Visualisation, May 27–28, 2010, Vienna, Austria.

A. Alfons, S. Kraft, M. Templ, and P. Filzmoser. *Simulation of population data for complex household surveys*. International Conference on Indicators and Survey Methodology, February 24–26, 2010, Vienna, Austria.

A. Alfons and M. Templ. *Simulation in robust statistics using the R package simFrame*. 2nd International Workshop of the ERCIM Working Group on Computing & Statistics, October 29–31, 2009, Limassol, Cyprus. **Invited talk**.

A. Alfons, M. Templ, and P. Filzmoser. *On the influence of imputation methods on Laeken indicators: simulations and recommandations*. UNECE Work Session on Statistical Data Editing, October 5–7, 2009, Neuchâtel, Switzerland.

M. Templ, A. Alfons, and P. Filzmoser. *Exploring the multivariate structure of missing values using the R package VIM*. useR! The R User Conference, July 8–10, 2009, Rennes, France.

M. Templ and A. Alfons. *Die Verwendung von Mikrodaten in der wissenschaftlichen Lehre*. Workshop zur Nutzung von SDS in der wissenschaftlichen Lehre, June 17, 2009, Vienna, Austria. **Invited talk**.

A. Alfons, M. Templ, and P. Filzmoser. *Complex survey data sets: Visualization of missing values in R*. Young European Statisticians Workshop YES-II "High dimensional statistics", October 6–8, 2008, Eindhoven, The Netherlands.

A. Alfons, S. Kraft, M. Templ, and P. Filzmoser. *Analyse und Visualisierung von EU-SILC Daten in R*. Workshop TU Wien/TU Dresden, September 24–28, 2008, Vorau, Austria. **Invited talk**.

Editorial and review work

Guest editor

A. Alfons, R. Stütz (2016). Special Issue on R. *Austrian Journal of Statistics*, 45(1).

Ad-hoc reviewer

Journal of Statistical Software, Journal of the Royal Statistical Society Series B, Journal of Machine Learning Research, Journal of the American Statistical Association, Journal of Business & Economic Statistics, Statistical Science, Briefings in Bioinformatics, R Journal, Journal of Computational and Graphical Statistics, Annals of Applied Statistics, Technometrics, Scandinavian Journal of Statistics, Machine Learning, Computational Statistics & Data Analysis, Advances in Data Analysis and Classification, Journal of Multivariate Analysis, Canadian Journal of Statistics, Statistics: A Journal of Theoretical and Applied Statistics, Statistical Methods & Applications, Statistical Methodology, Computational Statistics, Journal of Applied Statistics, Journal of Economic Inequality, Wiley Interdisciplinary Reviews: Computational Statistics, Austrian Journal of Statistics, AStA Wirtschafts- und Sozialstatistisches Archiv

Teaching experience

Erasmus University Rotterdam

- Lecturer for the courses *Statistics*, *Applied Statistics 2* and *Topics in Advanced Statistics* at Erasmus School of Economics.
- Lecturer for the courses *Introduction to Data Analysis with R* and *Advanced Data Analysis with R* in the ERIM research master and doctoral programs.
- Lecturer for the courses *Programming and Visualization for Business Analytics* and *Predictive Modelling: Forecasting* in the EQI postgraduate program Data & Business Analytics.

KU Leuven

- Lecturer for the course *Microeconometric Models* during the academic year 2012/2013

Vienna University of Technology

- Teaching staff for the course *Statistics and Probability for Computer Scientists* as a research assistant and doctoral student
- Teaching assistant for the courses *Algorithms and Data Structures 1* and *Data Modeling* as a student

Other

- Lecturer at the IASC-ERS Summer School on R, September 23–27, 2013, Vorau, Austria.
- Mentor for the project *robgpu: Highly parallelized implementations of robust statistical procedures using CUDA* in the Google Summer of Code 2013.
- Lecturer at the EDEN Doctoral Seminar on Statistical Methods for Management Research, September 14–16, 2011, Leuven, Belgium.
- Lecturer at the IASC-ERS Summer School on Robust Methods for Advanced Data Structures, September 6–9, 2011, Leuven, Belgium.

PhD supervision

- Max Welz, 2020 – present, co-promotor and daily supervisor, funded by an NWO Vidi grant.
- Gertjan van der Burg, 2014 – 2018, co-promotor.

Governance and service

Erasmus University Rotterdam, Erasmus School of Economics

- Master's thesis coordinator Business Analytics & Quantitative Marketing, 2018 – present
- Member of the Recruitment Committee of the Econometric Institute, 2020 – present
- Co-organizer of the seminar series in Econometrics, 2015 – 2018

International Association for Statistical Computing, European Regional Section (IASC-ERS)

- Member of the Board of Directors, 2016 – 2020

Event organization

Chair of the local organizing committee of the joint conference *Data Science, Statistics & Visualisation* and *European Conference on Data Analysis*, July 7–9, 2021, Rotterdam, The Netherlands (online), https://iasc-isi.org/dssv-ecda2021/

Co-organizer of the *Econometric Institute Workshop: Robust Statistics*, February 8–10, 2018, Rotterdam, Netherlands

Member of the organizing committee of the Summer School of the International Association for Statistical Computing (European Regional Section): *Robust Methods for Advanced Data Structures*, September 6–9, 2011, Leuven, Belgium, *http://wis.kuleuven.be/Events/IASC2011*

Co-organizer of the *International Conference on Indicators and Survey Methodology*, February 24–26, 2010, Vienna, Austria, http://www.statistik.tuwien.ac.at/ameli/

Scientific organizations

- Member of the International Association for Statistical Computing (IASC)
- Member of the Foundation for Open Access Statistics (FOAS)

Industry experience

2014 – 2015   **DataCamp**
Data scientist and software developer

2006 – 2008   **Self-employed** data analyst and programmer
Projects with:
- **Land-, forst- und wasserwirtschaftliches Rechenzentrum** GmbH
- **Bombardier Transportation Austria** GmbH & Co. KG
- **Federal Institute of Agricultural Economics** (AWI)