

Professor for Stochastics

Department for Artificial Intelligence & Human
Interfaces (AIHI)
University of Salzburg
Hellbrunner Strasse 34
5020 Salzburg, Austria

Tel: +43 662 8044-5326
hp: www.trutschnig.net
E-mail: wolfgang@trutschnig.net

Director IDA Lab Salzburg

hp: www.plus.ac.at/ida-lab/

Co-managing Director correlate analytics gmbh

hp: www.correlate.at

PROFILES

[Google scholar profile](#)
[Scopus Author ID: 25652347200](#)
[ORCID: 0000-0002-7131-1944](#)
[zbMATH entry](#)

PERSONAL
INFORMATION

Date of Birth: 14.01.1977
Place of Birth: Lienz, Tirol (Austria)
Citizenship: Austria

RESEARCH
INTERESTS

Probability Theory & Mathematical Statistics, Fractals, Analysis

- Copulas and Dependence Modeling
- Multivariate and Nonparametric Statistics
- Dynamical Systems (in discrete time) and their interplay with number theory
- Fractals, Singular Functions and Iterated Function Systems
- Markov Operators and Kernels
- Lineability, spaceability, algebraability, latticeability

Applied Statistics & Data Science

- Probabilistic fundamentals of Machine Learning
- Forecasting and Regression Techniques
- Feature Selection
- Dependence Modeling of processes
- Automatic Reporting with R and Miktex (knitr, R-Markdown)
- Interactive Dashboards with R-shiny, interactive graphics with plotly

TEXTBOOKS:
1

- [1] J. Fernández Sánchez, J. López-Salazar Codes, J.B. Seoane Sepúlveda, **W. Trutschnig**: *Generalized Notions of Continued Fractions: Ergodicity and Number Theoretic Applications* (1st ed.), Chapman and Hall/CRC (2023), doi:10.1201/9781003404064

PEER-REVIEWED
JOURNAL
PUBLICATIONS -
MATHEMATICS:
53
(SORTED BY
ACCEPTANCE DATE)

- [53] J. Fernández Sánchez, **W. Trutschnig**: A link between Kendall's τ , the length measure and the surface of bivariate copulas, and a consequence to copulas with self-similar support, *Dependence Modeling* **11**, 20230105 (2023), doi:10.1515/demo-2023-0105
- [52] T. Kasper, N. Dietrich, **W. Trutschnig**: On convergence and mass distributions of multivariate Archimedean copulas and their interplay with the Williamson transform, *Journal of Mathematical Analysis and Applications* **529**(1), 127555 (2024), doi:10.1016/j.jmaa.2023.127555
- [51] T. Mroz, J. Fernández Sánchez, S. Fuchs, **W. Trutschnig**: On distributions with fixed marginals maximizing the joint or the prior default probability, estimation, and related results, *Journal of Statistical Planning and Inference* **223**, 33-52 (2023), doi:10.1016/j.jspi.2022.07.005
- [50] F. Griessenberger, **W. Trutschnig**: Maximal asymmetry of bivariate copulas and consequences to measures of dependence, *Dependence Modeling* **10**, 1-25 (2022), doi:10.1515/demo-2022-0115

- [49] L. Bernal-Gonzalez, J. Fernandez-Sanchez, J.B. Seoane-Sepúlveda, **W. Trutschnig**: On special partitions of $[0, 1]$ and lineability within families of bounded variation functions, *Journal of Convex Analysis* **30**(1), 065-080 (2023)
- [48] J. Carmona Tapia, J. Fernández Sánchez, J.B. Seoane-Sepúlveda, **W. Trutschnig**: Lineability, Spaceability, and Latticeability of subsets of $C([0, 1])$ and Sobolev Spaces, *Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas* **116**, 113 (2022), doi:10.1007/s13398-022-01256-y
- [47] F. Griessenberger, R.R. Junker, **W. Trutschnig**: On a multivariate copula-based dependence measure and its estimation, *Electronic Journal of Statistics* **16**, 2206–2251 (2022), doi:10.1214/22-EJS2005
- [46] J. Fernández-Sánchez, D.L. Rodríguez-Vidanes, J.B. Seoane-Sepúlveda, **W. Trutschnig**: Lineability and K -linear discontinuous functions, *Linear Algebra and its Applications* **645**, 52-67 (2022), doi:10.1016/j.laa.2022.03.007
- [45] T. Kasper, S. Fuchs, **W. Trutschnig**: On convergence of associative copulas and related results, *Dependence Modeling* **9**, 307-326 (2021), doi:10.1515/demo-2021-0114
- [44] J. Fernández Sánchez, **W. Trutschnig**, M. Tschimpke: Markov product invariance in classes of bivariate copulas characterized by univariate functions, *Journal of Mathematical Analysis and Applications* **501**(2), 125185 (2021), doi:10.1016/j.jmaa.2021.125184
- [43] T. Mroz, S. Fuchs, **W. Trutschnig**: How simplifying and flexible is the simplifying assumption in pair-copula constructions - analytic answers in dimension three and a glimpse beyond, *Electronic Journal of Statistics* **15**(1), 1951-1992 (2021), doi:10.1214/21-EJS1832
- [42] F. Griessenberger, J. Fernández Sánchez, **W. Trutschnig**: Some properties of double shuffles of bivariate copulas and (extreme) copulas invariant with respect to Lüroth double shuffles, *Fuzzy Sets and Systems* **428**, 102-120 (2022), doi:10.1016/j.fss.2021.02.014
- [41] T. Kasper, S. Fuchs, **W. Trutschnig**: On weak conditional convergence of bivariate Archimedean and Extreme Value copulas, and consequences to nonparametric estimation, *Bernoulli* **27**(4), 2217-2240 (2021), doi:10.3150/20-BEJ1306
- [40] F. Durante, J. Fernández Sánchez, **W. Trutschnig**, M. Úbeda-Flores: On the size of subclasses of quasi-copulas and their Dedekind-MacNeille completion, *Mathematics* **8**(12), 2238 (2020), doi:10.3390/math8122238
- [39] S. Fuchs, **W. Trutschnig**: On quantile-based co-risk measures and their estimation, *Dependence Modeling* **8**, 396-416 (2020), doi:10.1515/demo-2020-0021
- [38] F. Durante, J. Fernández Sánchez, C. Ignazzi, **W. Trutschnig**: On extremal problems for pairs of uniformly distributed sequences and integrals with respect to copula measures, *Uniform Distribution Theory* **15**(2), 99–112 (2020), doi:10.2478/udt-2020–0013
- [37] J. Fernández Sánchez, J.B. Seoane-Sepúlveda, **W. Trutschnig**: Lineability, algebrability, and sequences of random variables, *Mathematische Nachrichten* **295**(5), 861–875 (2022) doi:10.1002/mana.202000102
- [36] J. Fernández Sánchez, D.L. Rodríguez-Vidanes, J.B. Seoane-Sepúlveda, **W. Trutschnig**: Lineability, differentiable functions and special derivatives, *Banach Journal of Mathematical Analysis* **15**, 18 (2021), doi:10.1007/s43037-020-00103-9
- [35] L. Bernal-González, J. Fernández Sánchez, J.B. Seoane-Sepúlveda, **W. Trutschnig**: Highly tempering infinite matrices II: From divergence to convergence via Toeplitz-Silverman matrices, *Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas* **114**, 202 (2020), doi:10.1007/s13398-020-00934-z
- [34] R.R. Junker, F. Griessenberger, **W. Trutschnig**: Estimating scale-invariant directed dependence of bivariate distributions, *Computational Statistics and Data Analysis* **153**, 107058 (2021), doi:10.1016/j.csda.2020.107058
- [33] J. Fernández Sánchez, D.L. Rodríguez-Vidanes, J.B. Seoane-Sepúlveda, **W. Trutschnig**: Lineability and integrability in the sense of Riemann, Lebesgue, Denjoy, and Khintchine, *Journal of Mathematical Analysis and Applications* **492**(1), 124433 (2020), doi:10.1016/j.jmaa.2020.124433

- [32] N. Kamnitsui, **W. Trutschnig**: On some properties of reflected maxmin copulas, *Fuzzy Sets and Systems* **393**, 53-74 (2020), doi:10.1016/j.fss.2019.07.007
- [31] J. Fernández Sánchez, **W. Trutschnig**: Nested square roots of 2 revisited, *American Mathematical Monthly* **127**(4), 344-351 (2020), doi:10.1080/00029890.2020.1707059
- [30] T. Mroz, **W. Trutschnig**: A sharp inequality for Kendall's τ and Spearman's ρ of Extreme-Value Copulas, *Dependence Modeling* **6**, 369–376 (2018), doi:10.1515/demo-2018-0021
- [29] N. Kamnitsui, Ch. Genest, P. Jaworski, **W. Trutschnig**: On the size of the class of bivariate extreme-value copulas with a fixed value of Spearman's rho or Kendall's tau, *Journal of Mathematical Analysis and Applications* **472**(1), 920–936 (2019), doi:10.1016/j.jmaa.2018.11.057
- [28] F. Durante, J. Fernández Sánchez, **W. Trutschnig**: Spatially homogeneous copulas, *Annals of the Institute of Statistical Mathematics* **72**(2), 607-626 (2020), doi:10.1007/s10463-018-0703-8
- [27] M. Coblentz, O. Grothe, M. Schreyer, **W. Trutschnig**: On the Length of Copula Level Curves, *Journal of Multivariate Analysis* **167**, 347-365 (2018), doi:10.1016/j.jmva.2018.06.001
- [26] N. Kamnitsui, J. Fernández Sánchez, **W. Trutschnig**: Maximum asymmetry of copulas revisited, *Dependence Modeling* **6**(1), 47–62 (2018), doi:10.1515/demo-2018-0003
- [25] J. Fernández Sánchez, **W. Trutschnig**: A note on singularity of a recently introduced family of Minkowski's question-mark functions, *Comptes rendus Mathématique* **355**(9), 956–959 (2017), doi:10.1016/j.crma.2017.09.009
- [24] F. Durante, J. Fernández Sánchez, **W. Trutschnig**: Baire category results for quasi-copulas, *Dependence Modeling* **4**, 215–223 (2016), doi:10.1515/demo-2016-0012
- [23] **W. Trutschnig**, M. Schreyer, J. Fernández Sánchez: Mass distributions of two-dimensional extreme-value copulas and related results, *Extremes* **19**, 405–427 (2016), doi:10.1007/s10687-016-0249-1
- [22] M. Schreyer, R. Paulin, **W. Trutschnig**: On the exact region determined by Kendall's tau and Spearman's rho, *Journal of the Royal Statistical Society: Series B (Statistical Methodology)* **79** (2), 613–633 (2017), doi:10.1111/rssb.12181
- [21] J. Fernández Sánchez, **W. Trutschnig**: Singularity aspects of Archimedean copulas, *Journal of Mathematical Analysis and Applications* **432**, 103-113 (2015), doi:10.1016/j.jmaa.2015.06.036
- [20] F. Durante, J. Fernández Sánchez, **W. Trutschnig**: A typical copula is singular, *Journal of Mathematical Analysis and Applications* **430**, 517-527 (2015), doi:10.1016/j.jmaa.2015.05.009
- [19] F. Durante, J. Fernández Sánchez, **W. Trutschnig**: Baire category results for exchangeable copulas, *Fuzzy Sets and Systems* **284**, 146-151 (2016), doi:10.1016/j.fss.2015.04.010
- [18] F. Durante, J. Fernández Sánchez, **W. Trutschnig**: Solution to an open problem about a transformation on the space of copulas, *Dependence Modeling* **2**, 65-72 (2014), doi:10.2478/demo-2014-0005
- [17] F. Durante, J. Fernández Sánchez, **W. Trutschnig**: On the singular components of a copula, *Journal of Applied Probability* **52**, 1175-1182 (2015), doi:10.1239/jap/1450802760
- [16] F. Durante, J. Fernández Sánchez, **W. Trutschnig**: Multivariate copulas with hairpin support, *Journal of Multivariate Analysis* **130**, 323-334 (2014), doi:10.1016/j.jmva.2014.06.009
- [15] J. Fernández Sánchez, **W. Trutschnig**: Conditioning based metrics on the space of multivariate copulas and their interrelation with uniform and levelwise convergence and Iterated Function Systems, *Journal of Theoretical Probability* **28**, 1311-1336 (2015), doi:10.1007/s10959-014-0541-4
- [14] J. Fernández Sánchez, **W. Trutschnig**: Some members of the class of (quasi-)copulas with given diagonal from the Markov kernel perspective, *Communications in Statistics - Theory and Methods* **45**, 1508-1526 (2016), doi:10.1080/03610926.2013.864856

- [13] **W. Trutschnig**, J. Fernández Sánchez: Copulas with continuous, strictly increasing singular conditional distribution functions, *Journal of Mathematical Analysis and Applications* **410**, 1014-1027 (2014), doi:10.1016/j.jmaa.2013.09.032
- [12] F. Durante, J. Fernández Sánchez, **W. Trutschnig**: On the interrelation between Dempster-Shafer Belief Structures and their Belief Cumulative Distribution Functions, *Knowledge-Based Systems* **52**, 107-113 (2013), doi:10.1016/j.knosys.2013.07.012
- [11] E. de Amo, M. Díaz Carrillo, J. Fernández Sánchez, **W. Trutschnig**: Some results on homeomorphisms between fractal supports of copulas, *Nonlinear Analysis Series A: Theory, Methods & Applications* **85**, 132-144 (2013), doi:10.1016/j.na.2013.02.027
- [10] **W. Trutschnig**: On Cesáro convergence of iterates of the Star Product of Copulas, *Statistics and Probability Letters* **83**, 357-365 (2013), doi:10.1016/j.spl.2012.09.025
- [9] **W. Trutschnig**, J. Fernández Sánchez: Some results on shuffles of two-dimensional copulas, *Journal of Statistical Planning and Inference* **143**, 251-260 (2013), doi:10.1016/j.jspi.2012.07.017
- [8] **W. Trutschnig**, J. Fernández Sánchez: Idempotent and multivariate copulas with fractal support, *Journal of Statistical Planning and Inference* **142**, 3086-3096 (2012), doi:10.1016/j.jspi.2012.06.012
- [7] **W. Trutschnig**: Some results on the convergence of (quasi-) copulas, *Fuzzy Sets and Systems* **191**, 113-121 (2012), doi:10.1016/j.fss.2011.06.013
- [6] **W. Trutschnig**: On a strong metric on the space of copulas and its induced dependence measure, *Journal of Mathematical Analysis and Applications* **384**, 690-705 (2011), doi:10.1016/j.jmaa.2011.06.013
- [5] A. Colubi, G. González-Rodríguez, M.A. Gil, **W. Trutschnig**: Nonparametric criteria for supervised classification of fuzzy data, *International Journal of Approximate Reasoning* **52**, Issue 9, 1272-1282 (2011), doi:10.1016/j.ijar.2011.05.007
- [4] **W. Trutschnig**: Characterization of the sendograph-convergence of fuzzy vectors by means of their L_p - and levelwise convergence, *Fuzzy Sets and Systems* **161** (8), 1064-1077 (2010), doi:10.1016/j.fss.2009.07.005
- [3] **W. Trutschnig**, G. González-Rodríguez, A. Colubi, M.A. Gil: A new family of metrics for compact, convex (fuzzy) sets based on a generalized concept of mid and spread, *Information Sciences* **179**, 3964-3972 (2009), doi:10.1016/j.ins.2009.06.023
- [2] G. González-Rodríguez, A. Colubi, **W. Trutschnig**: Simulation of fuzzy random variables, *Information Sciences* **179**, 642-653 (2009), doi:10.1016/j.ins.2008.10.018
- [1] **W. Trutschnig**: A strong consistency result for fuzzy relative frequencies interpreted as estimator for the fuzzy-valued probability, *Fuzzy Sets and Systems* **159**, 259-269 (2008), doi:10.1016/j.fss.2007.05.017

PEER-REVIEWED
 JOURNAL
 PUBLICATIONS -
 INTERDIS-
 CIPLINARY:
 # 24

- [24] M. Tschimpke, A. Gerber, S. Neubert, M. Schreyer, **W. Trutschnig**: Statistical Methods for Predicting of the Quality of Aluminum Ingots, *Key Engineering Materials* **968**, 109-116 (2023), doi:10.4028/p-MO8oIC
- [23] M. Hanusch, X. He, S. Janssen, J. Selke, **W. Trutschnig**, R.R. Junker: Uneven distribution of non-monotonicity reveals distinct association patterns between ecosystem constituents, *Ecosystems* **26**, 1819-1840 (2023), doi:10.1007/s10021-023-00867-9
- [22] W. Senker, H. Stefanits, S. Aspalter, **W. Trutschnig**, J. Franke, A. Gruber: Nonsteroidal anti-inflammatory drugs (NSAID) do not increase blood loss or the incidence of post-operative epidural hematomas when using minimally invasive fusion techniques in the degenerative lumbar spine, *Frontiers in Surgery* **9**:1000238 (2022), doi:10.3389/fsurg.2022.1000238
- [21] F. Griessenberger, **W. Trutschnig**, R.R. Junker: qad: An R-package to detect asymmetric and directed dependence in bivariate samples, *Methods in Ecology and Evolution* **13** 2138-2149 (2022), doi:10.1111/2041-210X.13951

- [20] M.J. Mair, M. Mitterer, P. Gattinger, J.M. Berger, **W. Trutschnig**, A.C. Bathke, M. Gansterer, A.S. Berghoff, S. Laengle, L. Gottmann, T. Buratti, H. Haslacher, W.W. Lamm, M. Raderer, S. Tobudic, T. Fuereder, R. Valenta, D. Fong, M. Preusser: Enhanced SARS-CoV-2 breakthrough infections in patients with hematologic and solid cancers due to Omicron, *Cancer Cell* **40** 444-446 (2022), doi:10.1016/j.ccell.2022.04.003
- [19] M.J. Mair, J.M. Berger, M. Mitterer, M. Gansterer, A.C. Bathke, **W. Trutschnig**, A.S. Berghoff, T. Perkmann, H. Haslacher, W.W. Lamm, M. Raderer, S. Tobudic, T. Fuereder, T. Buratti, D. Fong, M. Preusser: Third dose of SARS-CoV-2 vaccination in hematological patients and health care workers: humoral immune responses and adverse events - a retrospective cohort study, *The European Journal of Cancer* **165**, 184-194 (2022), doi:10.1016/j.ejca.2022.01.019
- [18] E. Gfrerer, D. Laina, G. Danae, M. Gibernau, R. Fuchs, M. Happ, T. Tolasch, **W. Trutschnig**, A.C. Hörger, H.P. Comes, S. Dötterl: Floral scents of a deceptive plant are hyperdiverse and under population-specific phenotypic selection, *Frontiers in Plant Science, section Functional Plant Ecology* **12**, 1910 (2021), doi:10.3389/fpls.2021.719092
- [17] J.M. Berger, M. Gansterer, **W. Trutschnig**, A.C. Bathke, R. Strassl, W. Lamm, M. Raderer, M. Preusser, A.S. Berghoff: SARS-CoV-2 screening in cancer outpatients during the second wave of the COVID-19 pandemic: conclusions for crisis response at a high-volume oncology center, *Wiener klinische Wochenschrift* **19**, 1-6 (2021), doi:10.1007/s00508-021-01927-7
- [16] S. Aspalter, W. Senker, C. Radl, H. Stefanits, M. Aichholzer, K. Hießböck, C. Leitner, N. Stroh, **W. Trutschnig**, A. Gruber: Accidental dural tears in minimally invasive spinal surgery for degenerative lumbar spine disease, *Frontiers in Surgery, section Neurosurgery* **8**, 226 (2021), doi:10.3389/fsurg.2021.708243
- [15] J. von Schleinitz, M. Graf, **W. Trutschnig**, A. Schröder: VASP: An autoencoder-based approach for multivariate anomaly detection and robust time series prediction with application in motorsport, *Engineering Applications of Artificial Intelligence* **104**, 104354 (2021), doi:10.1016/j.engappai.2021.104354
- [14] W. Senker, H. Stefanits, M. Gmeiner, **W. Trutschnig**, Ch. Radl, A. Gruber: The Influence of Smoking in Minimally Invasive Spinal Fusion Surgery, *Open Medicine* **16**(1), 198-206 (2021), doi:10.1515/med-2021-0223
- [13] M. Wagner, A.C. Bathke, S.C. Cary, T.G.A. Green; R.R. Junker, **W. Trutschnig**, U. Ruprecht: Myco- and photobiont associations in crustose lichens in the McMurdo Dry Valleys (Antarctica) reveal high differentiation along an elevational gradient, *Polar biology* **43**, 1967-1988 (2020), doi:10.1007/s00300-020-02754-8
- [12] A.S. Berghoff, M. Gansterer, A.C. Bathke, **W. Trutschnig**, P. Hungerländer, J. Berger, J. Kreminger, A. Starzer, R. Schmidt, W. Lamm, M. Raderer, A. Gottlieb, N. Mauser, M. Preusser: SARS-CoV-2 testing in 1016 consecutive cancer patients treated at a tertiary care hospital during the COVID-19 pandemic, *Journal of Clinical Oncology* **38**(30), 3547-3554 (2020), doi:10.1200/JCO.20.01442
- [11] R.R. Junker, M. Hanusch, X. He, V. Ruiz-Hernández, J.C. Otto, S. Kraushaar, K. Bauch, F. Griessenberger, L.-M. Ohler, **W. Trutschnig**: Ödenwinkel: An Alpine platform for observational and experimental research on the emergence of multidiversity and ecosystem complexity, *Web Ecology* **20**, 95-106 (2020), doi:10.5194/we-20-95-2020
- [10] R. Schuster, M.L. Schreyer, T. Kaiser, T. Berger, J.P. Klein, S. Moritz, A.R. Laireiter, **W. Trutschnig**: Effects of intense assessment on statistical power in randomized controlled trials: Simulation study on depression, *Internet Interventions* **20**, 100313 (2020), doi:10.1016/j.invent.2020.100313
- [9] W. Senker, H. Stefanits, M. Gmeiner, **W. Trutschnig**, Ch. Radl, A. Gruber: The Influence of Age on the Peri- and Postoperative Clinical Course in Patients Undergoing Minimally Invasive Transforaminal Lumbar Interbody Fusion Techniques of the Lumbar Spine, *Clinical Neurology and Neurosurgery* **182**, 25-31 (2019), doi:10.1016/j.clineuro.2019.04.025
- [8] W. Senker, H. Stefanits, M. Gmeiner, **W. Trutschnig**, Ch. Radl, A. Gruber: The Impact of Type 2 Diabetes on the Peri- and Postoperative Outcomes of Minimally Invasive Fusion Techniques in the Lumbar Spine, *Journal of Neurosurgical Sciences* **64**(6), 509-514 (2020), doi:10.23736/S0390-5616.18.04467-3

- [7] J.H. Parkinson, R. Kutil, J. Kuppler, R.R. Junker, **W. Trutschnig**, A.C. Bathke: A Fast and Robust Way to Estimate Overlap of Niches, and Draw Inference, *International Journal of Biostatistics* **14**(2) (2018), doi:10.1515/ijb-2017-0028
- [6] W. Senker, H. Stefanits, M. Gmeiner, **W. Trutschnig**, I. Weinfurter, A. Gruber: Does obesity affect peri- and postoperative morbidity and complication rates after minimal access spinal technologies (MAST) in surgery for lumbar degenerative disc disease?, *World Neurosurgery*, **111**, e374–e385 (2018), doi:10.1016/j.wneu.2017.12.075
- [5] J. Kuppler, M. Höfers, **W. Trutschnig**, A.C. Bathke, J. Eiben, C.C Daehler, R. Junker: Exotic flower visitors exploit large floral trait spaces resulting in asymmetric resource partitioning with native visitors, *Functional Ecology* **31**(12), 2244–2254 (2017), doi:10.1111/1365-2435.12932
- [4] M. Wagner, **W. Trutschnig**, A.C. Bathke, U. Ruprecht: A first approach to calculate BIOCLIM variables and climate zones for Antarctica, *Theoretical and Applied Climatology* **131**, 1397–1415 (2018), doi:10.1007/s00704-017-2053-5
- [3] S. Pittner, B. Ehrenfellner, A. Zissler, V. Racher, **W. Trutschnig**, A.C. Bathke, A.M. Sängler, W. Stoiber, P. Steinbacher, F.C. Monticelli: First application of a protein based approach for time since death estimation, *International Journal of Legal Medicine* **131**(2), 479–483 (2017), doi:10.1007/s00414-016-1459-4
- [2] R.R. Junker, J. Kuppler, A.C. Bathke, M.L. Schreyer, **W. Trutschnig**: Dynamic range boxes - A robust non-parametric approach to quantify size and overlap of n -dimensional hypervolumes, *Methods in Ecology and Evolution* **7**(12), 1503–1513 (2016), doi:10.1111/2041-210X.12611
- [1] P. Ranacher, R. Brunauer, **W. Trutschnig**, S. Van der Spek, S. Reich: Why GPS makes distances bigger than they are, *International Journal of Geographical Information Science* **30**, 316–333 (2016), doi:10.1080/13658816.2015.1086924
(open access, 9.000 reads in the period October 2015 - January 2016)

SUBMITTED FOR
PUBLICATION -
MATHEMATICS

- [2] M. Tschimpkea, M. Schreyer, **W. Trutschnig**: Revisiting the region determined by Spearman's ρ and Spearman's footrule ϕ , [arXiv preprint](#)
- [1] J. Ansari, P.B. Langthaler, S. Fuchs, **W. Trutschnig**: Quantifying and estimating dependence via sensitivity of conditional distributions, [arXiv preprint](#)

SUBMITTED FOR
PUBLICATION -
INTERDISCIPLINARY

- [1] M. Löckinger, **W. Trutschnig**, W. Ulrich, P. Gros, T. Schmitt, J.C. Habel: Ecological performance determines phenological responses of butterflies in Northern Austria

BOOKS AND BOOK
CHAPTERS

- [11] N. Dietrich, J. Fernández-Sánchez, **W. Trutschnig**: Convergence of Copulas Revisited: Different Notions of Convergence and Their Interrelations, in L.A. García-Escudero et al. (Eds.): *Building Bridges between Soft and Statistical Methodologies for Data Science*, Series: Advances in Soft Computing, Volume 1433, pp. 120–127 (2023), Springer Nature Switzerland, doi:10.1007/978-3-031-15509-3_16
- [10] Thimo M. Kasper, **W. Trutschnig**: A Markov Kernel Approach to Multivariate Archimedean Copulas, in L.A. García-Escudero et al. (Eds.): *Building Bridges between Soft and Statistical Methodologies for Data Science*, Series: Advances in Soft Computing, Volume 1433, pp. 224–230 (2023), Springer Nature Switzerland, doi:10.1007/978-3-031-15509-3_30
- [9] **W. Trutschnig**, F. Griessenberger: On Quantifying and Estimating Directed Dependence, in L.A. García-Escudero et al. (Eds.): *Building Bridges between Soft and Statistical Methodologies for Data Science*, Series: Advances in Soft Computing, Volume 1433, pp. 382–389 (2023), Springer Nature Switzerland, doi:10.1007/978-3-031-15509-3_50
- [8] F. Griessenberger, **W. Trutschnig**: Estimating Asymmetric Dependence via Empirical Checkerboard Copulas, in A. Pollice, N. Salvati, S. Spagnolo (Eds) *Book of Short Papers SIS 2020*, pp. 304–309 (2020), [link to pdf](#)

- [7] **W. Trutschnig**: Complete dependence everywhere?, in M. Úbeda Flores, E. de Amo Artero, F. Durante, J. Fernández Sánchez (Eds) *Copulas and Dependence Models with Applications - Contributions in Honor of Roger B. Nelsen*, pp. 225-240, Springer (2017), doi:10.1007/978-3-319-64221-5
- [6] F. Durante, J. Fernández Sánchez, **W. Trutschnig**: Singular copulas, *Oberwolfach Reports*, 2015(20), 40-43, doi:10.4171/OWR/2015/20
- [5] **W. Trutschnig**, J. Fernández Sánchez: Some consequences of the Markov kernel perspective of copulas, in K. Glau, M. Scherer, R. Zagst (Eds) *Innovations in Quantitative Risk Management*, Springer Proceedings in Mathematics & Statistics, Volume 99, pp. 393-409, Springer Berlin/Heidelberg (2014), doi:10.1007/978-3-319-09114-3_23
- [4] **W. Trutschnig**: Some smoothing properties of the Star Product of copulas, in: R. Kruse et al. (Eds) *Synergies of Soft Computing and Statistics for Intelligent Data Analysis*, Series: Advances in Intelligent and Soft Computing, Volume 190, Part 4, pp. 349-357, Springer Berlin/Heidelberg (2013), doi:10.1007/978-3-642-33042-1_38
- [3] **W. Trutschnig**: Idempotent copulas with fractal support, in: S. Greco et al. (Eds) *Communications in Computer and Information Science*, Series: Advances in Computational Intelligence, Volume 298, Part 3, pp. 161-170, Springer Berlin/Heidelberg (2012), doi:10.1007/978-3-642-31715-6_18
- [2] C. Borgelt, G. González-Rodríguez, **W. Trutschnig**, M.A. Lubiano, M.A. Gil, P. Grzegorzewski, O. Hryniewicz (Eds): *Combining Soft Computing and Statistical Methods in Data Analysis*, Series: Advances in Intelligent and Soft Computing, Vol. 77, Springer Berlin/Heidelberg (2010), doi:10.1007/978-3-642-14746-3
- [1] M.A. Lubiano, **W. Trutschnig**: ANOVA for fuzzy random variables Using the R-package SAFD in: C. Borgelt et al. (Eds): *Combining Soft Computing and Statistical Methods in Data Analysis*, Series: Advances in Intelligent and Soft Computing, Vol. 77, pp. 449-456, Springer Berlin/Heidelberg (2010), doi:10.1007/978-3-642-14746-3_56

SHORTLIST POSITIONS

- Full professorship ‘Statistics’ (direct call from abroad) at the University of Bozen, 1st place (05/2023), declined
- Full professorship §99 UG ‘Statistics’ at the University of Klagenfurt, 1st place (11/2019), not invited to negotiations
- Associate professorship ‘Statistics’ at the University of Bozen, 2nd place (10/2017)
- Full professorship §98 UG ‘Applied Statistics’ at the Technical University Graz, 3rd place (02/2017)

HONORS

- Gambrinus Fellowship of the Technical University of Dortmund (DE); collaboration partner: Prof. Dr. Karl Friedrich Siburg (06/2019)
- Winner of the University of Salzburg’s Kurt-Zopf-Förderpreis 2018 (for the paper [22])
- Winner of the University of Salzburg’s Excellence in Teaching Award (category: best lecture); for the course ‘Fractals and Chance’ (05/2017)
- Winner of the Austrian Statistical Association’s price for dissertations in Mathematical Statistics (2007)
- Excellence Scholarship of the Vienna University of Technology (1996-1999, 2002)

EDITORIAL WORK

- Associate Editor for *Biometrical Journal*
- Associate Editor for *Econometrics and Statistics (EcoSta)*
- Associate Editor for *Research in Statistics*
- Guest Co-editor for the Dependence Modeling Special Issue for the Salzburg workshop on Dependence Models & Copulas

- Editorial Advisory Board member of *Dependence Modeling* (appointed for the period 2018-01-01 till 2023-12-31)
- Editorial Board member of *Fuzzy Sets and Systems*
- Editorial Board member of *Austrian Journal of Statistics*

REFEREE

Applied Mathematics Letters; Austrian Journal of Statistics; Bernoulli; Canadian Journal of Statistics; Chaos, Solitons & Fractals; Communications in Statistics; Computational Statistics and Data Analysis; Computers and Mathematics with Applications; Dependence Modeling; Econometrics; Electronic Journal of Statistics; European Actuarial Journal; European Journal of Operational Research; Extremes; Fuzzy Sets and Systems; Heliyon Mathematics; IEEE Transactions on Fuzzy Systems; Information Sciences; International Journal of Approximate Reasoning; International Journal of Geographical Information Science; International Journal of Uncertainty; Journal of Computational and Applied Mathematics; Journal of Mathematical Analysis and Applications; Journal of Multivariate Analysis; Journal of Statistical Planning and Inference; Journal of the American Statistical Association; Knowledge-Based Systems; Kybernetika; Letters in Biomathematics; Mathematical Reviews; Mechanical Systems and Signal Processing; Metrika; Risks; Soft Computing; Statistics & Probability Letters; TEST

SCIENTIFIC COMMITTEES

- Co-Chair of the specialized team on Dependence Models and Copulas within the ERCIM Workgroup on Computational and Methodological Statistics (together with Fabrizio Durante and Ivan Kojadinovic)
- Co-Chair of the SMPS 2024 conference, Salzburg, 2024 (together with Jonathan Ansari and Sebastian Fuchs)
- Management committee member (rep. Austria) of the ICT COST Action IC1408 CRoNoS (Computationally-intensive methods for the robust analysis of non-standard data)
- Local Co-Organizer of the 10th International Workshop on Simulation and Statistics, September 02-06 2019, Salzburg, Austria
- Chair of the Austrian Stochastic Days 2017 (as satellite meeting of the ÖMG-DMV congress 2017), September 12-13, Salzburg, Austria
- Organizer of the session *Recent advances in dependence modelling and optimization* at the Workshop on Copulas and Their Applications celebrating the 75th birthday of Roger B. Nelsen, July 03-05, 2017, Almería, Spain
- Co-Organizer of the sessions *Dependence models and copulas I-IV* at the CMStatistics 2016, December 09-11 2016, Seville, Spain (together with Fabrizio Durante)
- Chair of the Salzburg Workshop on Dependence Models and Copulas, September 19-22 2016, Salzburg, Austria
- Co-Organizer of the session *Data Analysis with Dependence Models* at the SMPS 2016, September 12-14 2016, Rome, Italy (together with Fabrizio Durante)
- Co-Organizer of the sessions *Dependence models and copulas I-III* at the CMStatistics 2015, December 12-14 2015, London, UK (together with Fabrizio Durante)
- Organizer of the session *Copulas* at the Österreichische Statistiktage 2015, October 21-23 2015, Vienna, Austria
- Co-Organizer of the sessions *Dependence models and copulas: Theory* and *Dependence models and copulas: Applications* at the ERCIM 2014, December 6-8 2014, Pisa, Italy (together with Fabrizio Durante)
- Co-Organizer of the sessions *Mathematical Aspects of Copulas I + II*, *Dependence Models in Environmental Sciences* at the ERCIM 2013, December 14-16 2013, Senate House, University of London, London, UK (together with Fabrizio Durante)
- Organizer of the sessions *Copulas I-III* at the ERCIM 2012, December 1-3 2012, Conference Centre, Oviedo, Spain
- Co-Chair of the Fifth International Conference on Soft Methods in Probability and Statistics SMPS 2010, September 28 - October 1 2010, Oviedo/Mieres, Spain

- Organizer of the session *Statistics with fuzzy or incomplete data* at the ERCIM 2009, October 29-31 2009, Grand Resort Hotel, Limassol, Cyprus
- *Quantifying and estimating (directed) dependence via sensitivity of conditional distributions*, Seminar for Statistics, KU Leuven, November 09, 2023, Leuven Belgium
- *Quantifying and estimating (multivariate) directed dependence*, at the SMPS 2022, September 15 2022, Valladolid, Spain
- *Quantifying and estimating (multivariate) directed dependence*, at the CDAM: Stochastics and Data Science, September 07 2022, Minsk, Belarus, online (*invited plenary speaker*)
- *Mathematical aspects of copulas*, at the Mathematisches Kolloquium @TU Dortmund, June 27 2022, Dortmund, Germany
- *Forecasting täglicher Verkaufszahlen in Supermärkten: mögliche Methodik, der Einfluss von Promotionen und Kannibalismus-Effekte*, at the 17th Predictive Analytics Konferenz, October 12-13 2021, Vienna, Austria
- *Stochastic (dynamical and topological) aspects of copulas*, at the Oberseminar Analysis, Mathematische Physik & Dynamische Systeme @TU Dortmund, June 29 2021, via zoom
- *Quantifying And Estimating Asymmetric Dependence*, at the 10th International Workshop on Simulation and Statistics, September 02-06 2019, Salzburg, Austria
- *Quantifying asymmetric dependence with the R-package qad*, at the Symposium: Ecology — Geomorphology — Statistics, March 28-29 2019, Salzburg, Austria (*keynote speaker*)
- *The Markov product of copulas revisited*, at the CMStatistics 2018 (ERCIM 2018), December 14-16 2018, Pisa, Italy
- *On the interrelation between Kendall's τ and Spearman's ρ* , at the International Statistics Festival Ulm, September 17-18 2018, University of Ulm, Germany
- *Stochastic, dynamical and topological aspects of copulas*, at the 7th Austrian Stochastics Days, September 13-14 2018, Vienna University of Economics and Business, Austria (*keynote speaker*)
- *Complete dependence everywhere?*, at the Workshop on Copulas and Their Applications celebrating the 75th birthday of Roger B. Nelsen, July 03-05, 2017, Almería, Spain
- *Complete dependence everywhere?*, Vienna University of Technology, May 08 2017, Vienna, Austria
- *Three copula-based optimization problems and an excursion*, at the CMStatistics 2016, December 09-11 2016, Seville, Spain
- *On sharp inequalities between Kendall's τ and Spearman's ρ* , at the CMStatistics 2015, December 12 2015, London, UK

INVITED TALKS
(SINCE 2015)

TEACHING
EXPERIENCE

University of Salzburg, Salzburg, Austria

Full/Associate/Assistant Professor

since 10/2013

- (Mathematical) Statistics (Lecture and Exercise for Bachelor Students in Mathematics, 2+1h, 5th Semester), 7 times
- Fractals and Chance (Lecture for Bachelor/Master Students of Mathematics, 2h), 3 times
- Applied (mathematical) Statistics (Lecture and exercise for Bachelor Students in Mathematics, 2h, 6th semester), 5 times
- PhD Seminar Statistics (for PhD Students in Mathematics, 1h), together with Arne Bathke, 14 times
- (Elementary) Regression Methods & Computational Statistics (Lecture for Master Students in Data Science, 2h), 3 times
- Dependence Modelling (Lecture and Exercise for Master and PhD Students in Mathematics, 3h), 3 times
- Markov Processes in discrete time (Lecture for Master Students in Mathematics, 2h)
- Introduction to Ergodic Theory (Lecture for Bachelor/Master Students of Mathematics, 2h)

- Research Seminar Stochastics (Seminar for Master and PhD Students in Mathematics, 1-2h)
- Statistics, Visualization and More Using R (Seminar/Computer Lab for Master- and PhD Students in Psychology and Master Students in Data Science, 2h), 4 times
- Introductory statistics for earth scientists (Lecture and exercise for Bachelor Students in Geology, 2h), 2 times
- Interpreting and Presenting Statistical Analyses (Seminar for Master Students in Data Science, 2h), together with Arne Bathke, 2 times
- Case Studies (Seminar for Master Students in Data Science, 2h), together with Nikolaus Augsten, Arne Bathke and Roland Kwitt, 2 times
- R Introduction via Applied Statistics (Seminar/Computer Lab for PhD Students in Psychology, 2h), together with Walter Gruber, 3 times
- Scientific Computing with Matlab and R (Lecture/Exercise for Bachelor Students in Mathematics, 3h), together with Lothar Banz, 3 times
- Introduction to Data Science (Lecture/exercise for Master Students Data Science, 1h), together with Nikolaus Augsten, Arne Bathke, Christian Borgelt, and Roland Kwitt, 2 times
- R for advanced users (Seminar/Computer Lab for PhD Students in Psychology, 2h), together with Walter Gruber, 2 times
- Mathematical Software R/Matlab/Mathematica (Lecture for Bachelor Students in Mathematics, 3h), together with Lothar Banz and Andreas Schröder, 2 times
- Automatic reporting with knitR (training and further education for employees of University Salzburg, 1h)
- (Basic) Mathematics for Neuroscientists (for PhD students of the DK Imaging the Mind, 1h)
- Refresher course Applied Statistics (training and further education for employees of University Salzburg, 1h)
- Stochastic modeling (Exercise for Students of Mathematics, 4th Semester, 2h), 2 times
- Mathematics I and Mathematics II (Exercise for Students of Material Sciences, 2h)

European Centre for Soft Computing, Mieres, Spain

Lecturer

2010 - 2012

- Introduction to R (Seminar/Lecture)
- R Computer Lab

Vienna University of Technology, Vienna, Austria

Teaching assistant

1999 - 2008

- Measure and Probability Theory (Exercise), 3 times
- Applied Statistics for Mathematicians (Exercise), 3 times
- Introduction to Probability Theory and Statistics (Exercise), 3 times
- Mathematics 1-3 for Electrical Engineers (Exercise), 3 times
- Introduction to Probability Theory and Statistics for Computer Scientists (Exercise), 3 times

SUPERVISION
(PHD)

University of Salzburg, Salzburg, Austria

- Lea Maislinger (PhD student in Mathematics), since 03/2024
- Nicolas Dietrich (PhD student in Mathematics), since 07/2021
- Marco Tschimpke (PhD student in Mathematics), since 01/2021
- Thomas Mroz: *Copula-based Optimization and related problems*, finished 09/2023
- Thimo Kasper: *New results for special classes of (multivariate) copulas and some consequences to estimating dependence*, finished 12/2022
- Florian Griessenberger: *A new (multivariate) copula-based measure of dependence and some additional results in dependence modeling*, finished 06/2022
- Julian von Schleinitz (PhD student in Data Science, co-supervision): *Machine Learning based Data Analysis at the Limit of Driving Dynamics*, finished 02/2022
- Noppadon Kamnitui: *Special Classes of Copulas and their Properties*, finished 10/2019
- Manuela Schreyer: *Some new results in copula theory*, finished 10/2018

SUPERVISION
(MASTER)

University of Salzburg, Salzburg, Austria

- Lea Maislinger (Master student in Mathematics): *Shuffles of Copulas, Double Shuffles of Copulas and their Interrelations with the Star Product*, finished 02/2024
- Magdalena Tovilo (Master student in Data Science): *Regions between pairs of measures of association based on bivariate copulas*, finished 02/2024
- Anna-Lena Graf (Master student in Mathematics): *Checkerboard Copula Estimator - Properties and Applications*, finished 11/2023
- Melanie Löckinger (Master student in Data Science): *An Analysis of Phenological Data of Butterflies in Salzburg*, finished 11/2023
- Anna-Lena Graf (Master student in Data Science): *Modern methods for unsupervised and supervised feature selection applied to the automotive industry*, finished 09/2023
- Mohamed Mbaye (AIMS Senegal Master student): *The copula based dependence measure ζ_1 and its estimator*, finished 07/2023
- Nina Marie Schmitzberger (Master student in Mathematics, in collaboration with BMW group): *Dependence Modelling and Association Rule Mining for Dynamic Error Classification in the Automotive Industry*, finished 04/2021
- Marco Tschimpke (Master student in Mathematics): *Markov product invariance in classes of bivariate copulas characterized by univariate functions*, finished 12/2020
- Lukas Klaffenböck (Master student in Mathematics): *The consistency of the CART-Algorithm and a special case of random forests*, finished 12/2020
- Alexander Roßmann (Master student in Mathematics): *On weak conditional convergence of copulas and related concepts*, finished 10/2020
- Iris Rammelmüller (Master student in Mathematics, in collaboration with Noemi Castelletti from HelmholtzZentrum münchen): *Biological-Based Models of Carcinogenesis in the Lung from Radiation in the Eldorado cohort*, finished 09/2020
- Klemens Kurtz (Master student in Data Science, in collaboration with KTM Innovation GmbH): *Sensor failure prediction on MotoGP motorcycles*, finished 09/2020
- Simone Müller (Master student in Data Science): *Nightclub detection with image classification using convolutional neural networks*, finished 09/2019
- Marcel Steger (Master student in Data Science, in collaboration with Porsche Informatik): *Methods for Feature Selection*, finished 08/2019
- Florian Griessenberger (Master student in Mathematics): *Measure-theoretic properties of copulas & Quantification of dependence*, finished 10/2018
- Guido Friesacher (Master student in Mathematics): *Analyzing log-returns using Copulas*, finished 10/2016
- Eva Andrea Eder (student teacher in Mathematics/Biology): *Fraktale - Von der Natur inspiriert und durch die Mathematik in die heutige Zeit integriert*, finished 05/2016

European Centre for Soft Computing, Mieres, Spain

- Julia Lastra: *Teoría de Cópulas - Cópulas con soporte fractal*, within the Master in Advanced Mathematics (University of Almería), finished 09/2013, together with Enrique de Amo Artero
- Héctor Fernández Martínez: *Product demand prediction*, within the Master in Soft Computing and Intelligent Data Analysis, finished 07/2010, together with Ana Colubi

SUPERVISION
(BACHELOR)

University of Salzburg, Salzburg, Austria

- Lea Maislinger (Bachelor student in Mathematics), *Prognosemodelle für Zeitreihen aus dem Automobilssektor*, finished 10/2021
- Stefanie Schmerbauch (Bachelor student in Mathematics): *Knowing X, knowing Y? Über asymmetrische Abhängigkeit von Zufallsvariablen*, finished 09/2021
- Martin Geroldinger (Bachelor student in Mathematics): *Zeitreihenanalysen und Prognosen: Theorie und Anwendung*, finished 09/2020
- Wanda Lauth (Bachelor student in Mathematics): *Gemischte Lineare Modelle: Theorie und Anwendung zur Beschreibung der Arbeitsmoral*, finished 01/2020
- Selina Miller (Bachelor student in Mathematics): *Regression: eine Anwendung zu 'Time Since Death Estimation' und mathematische Resultate zur Kernel-Regression*, finished 09/2019
- Florian Günther (Bachelor student in Mathematics): *Spieltheorie und Nash-Gleichgewicht*, finished 08/2019

- Nina Marie Schmitzberger (Bachelor student in Mathematics): *Visualisieren von Daten in R mit ggplot2, lineare und nichtparametrische Regression und deren Anwendung in der 'Carotisstudie'*: finished 08/2018
- Jakob Schmollgruber (Bachelor student in Mathematics): *Markov Ketten und Random Walk*, finished 01/2017
- Philipp Schwartenbeck (Bachelor student in Mathematics): *Frequentist and Bayesian parameter estimation*, finished 12/2016
- Gianna Liehr (Bachelor student in Mathematics): *Julia Mengen*, finished 11/2016
- Victoria Racher (Bachelor student in Mathematics): *Eine Anwendung multipler linearer Regression und Grundzüge der Bayes Statistik auf 'Time Since Death Estimation'*, finished 09/2016
- Lukas Helminger (Bachelor student in Mathematics): *Maximierung der Masse des Graphen/Endographen einer nicht fallenden Transformation innerhalb der Klasse der Copulae*, finished 08/2016
- Florian Griessenberger (Bachelor student in Mathematics): *Parametrische und nichtparametrische Regression und ihre Anwendung*, finished 07/2016
- Sebastian Heintze (Bachelor student in Mathematics): *Periodische Punkte und chaotische Eigenschaften von Funktionen*, finished 06/2016

SERVICE TO THE UNIVERSITY

- Deputy head of the department for Artificial Intelligence & Human Interaction (AIHI), since 2022
- Workgroup leader of the Data Science, Statistics and Stochastics group, department for AIHI, since 2022
- Chairman of the habilitation committee of Dr. Sebastian Fuchs, 2022
- Member of the working group on quality development in teaching (AG QE Studium und Lehre), University of Salzburg, 2018-2019
- Member of the Curricularkommission for Bachelor AI, University of Salzburg, since 2022
- Member of the Curricularkommission for Mathematics, University of Salzburg, 2016 - 2019
- Member of the Curricularkommission for Data Science, University of Salzburg, 2016 - 2021
- Deputy-chairman of the appointment committee for the §99 full professorship (Stiftungsprofessur) for Data Science at the University Salzburg, 2017/2018
- Jury member for the University of Salzburg's Excellence in Teaching Award (2018)
- Referee for the Marie Andessner Preise für Diplom- und Masterarbeiten 2017
- Coaching for female students (Bachelor Mathematics), together with Bettina Sereinig
- Active member of the Math2School-Team
- Core faculty member of the Data Science Salzburg initiative

SOFTWARE

R-packages:

- **qmd**: A multivariate copula-based dependence measure (together with Florian Griessenberger and Robert R. Junker)
- **qad**: A copula-based measure for quantifying asymmetry in dependence and associations (together with Florian Griessenberger and Robert R. Junker)
- **Chaos game**: Plot fractal words in dimension two and three (together with Manuela Schreyer)
- **dynRB**: Calculate niche size and overlap using dynamic range boxes (together with Manuela Schreyer, Robert R. Junker, Jonas Kuppler, Arne Bathke)

THIRD-PARTY FUNDING
 $\geq \text{€ } 5.6 \text{ Mio.}$
 AS PI

Data Science PhD, University of Salzburg, Salzburg, Austria

Project leader

2022 -

- Supervision of 1 PhD student in Data Science/Statistics (for 3 years)
- Funded by Red Bull

ProSA - Prozessanalyse Ultraschallanzeigen, University of Salzburg, Salzburg, Austria

Project leader

2021 -

- Development of statistical/machine learning methods for process optimization
- Supervision of 1 PhD student in Data Science/Statistics (for 3.5 years)
- Funded by AMAG

Chaos Game (Talente: Praktika für Schülerinnen und Schüler 2020), University of Salzburg, Salzburg, Austria

Supervisor 2020

- Improving the R-package ChaosGame
- Funded by Österreichische Forschungsförderungsgesellschaft mbH

IDA Lab Salzburg (Lab for Intelligent Data Analytics), University of Salzburg, Salzburg, Austria

Director 2020 -

- Establishment of a research center with several research teams (lead by 6 postdocs, for 5 years)
- Funded by Land Salzburg (within the WISS 2025)
- Applied research in statistics and machine learning

Sensor failure prediction on MotoGP motorcycles, University of Salzburg, Salzburg, Austria

Project leader 2019 - 2020

- Predictive Maintenance MotoGP sensors
- Funded by KTM Innovation GmbH

Wohnbaudatenbank (Analyse und GUI), University of Salzburg, Salzburg, Austria

Project leader (together with Arne Bathke) 2019 - 2020

- Data analytics Wohnbaudaten
- Funded by the province of Salzburg (im Rahmen der Wohnbauforschungsmittel)

KFZ, University of Salzburg, Salzburg, Austria

Project leader (together with Roland Kwitt) 2019 - 2022

- Basic research in statistics and machine learning
- Supervision of 2 fulltime PhD students in Data Science (for 3 years)
- Funded by Porsche Informatik and Land Salzburg (within the WISS 2025)

Successional Generation of Functional Multidiversity, University of Salzburg, Salzburg, Austria

Cooperation partner of START price winner Robert R. Junker 2018 -

- Responsible for the development of statistical methods for the quantification of asymmetric dependence and the supervision of 1 PhD student (for 3 years)
- Der Standard article on the project (in German)

Data Analytics in Industrial Environments, University of Salzburg, Salzburg, Austria

Project leader (together with Roland Kwitt) 2018

- Data Science: Production of the Future, Smart Sales and Customer Analytics
- For Siemens Austria, Vienna, Austria

Forecasting material requirements, University of Salzburg, Salzburg, Austria

Project leader 2018

- Forecasting techniques, merging of different data sources
- For HAI - Hammerer Aluminium Industries, Ranshofen, Austria

Data Science Endowed Professorship, University of Salzburg, Salzburg, Austria

Co-applicant (together with Arne Bathke) 2018 - 2023

- Data Science Endowed Professorship (5 years) at the University of Salzburg, funded by the province of Salzburg, the City of Salzburg and the Federation of Austrian Industries

NIRS Analysis, University of Salzburg, Salzburg, Austria

Project leader 2017

- Analysis Near Infrared Spectroscopy (NIRS) data
- For Universitätsklinik für Anästhesiologie, perioperative Medizin und allgemeine Intensivmedizin, Salzburg, Austria

- Analysis questionnaire data Diacerin for EBS**, University of Salzburg, Salzburg, Austria
Project leader 2016
- Statistical testing for positive treatment effects
 - For Prof. Dr. Johann Bauer/EB-Haus Austria
- Prozessdatenanalyse Walzenproduktion**, University of Salzburg, Salzburg, Austria
Assistant project leader 2015
- Detection of possible factors relevant for product quality
 - Development of an R-shiny app to simplify data analysis for experts
 - For Eisenwerk Sulzau-Werfen
- SIMOP II project**, European Centre for Soft Computing, Mieres, Spain
Project leader 2012 - 2013
- In collaboration with a regional Spanish supermarket chain
 - Analysis/quantification of the effect of product offers to sales numbers of related products
- SIMOP I project**, European Centre for Soft Computing, Mieres, Spain
Project leader 2011 - 2012
- In collaboration with a regional Spanish supermarket chain
 - Optimization of the delivery system of an Asturian supermarket chain based on the forecasting of daily sales numbers of products during offer and non-offer periods
- Cajacash-project**, European Centre for Soft Computing, Mieres, Spain
Operating project member 2010
- In collaboration with cajastur (Asturian savings bank)
 - Forecasting daily withdrawn amounts at cash machines (ATMs) to improve the cash delivery system
- MICINN-project**, European Centre for Soft Computing, Mieres, Spain
Project leader (since 2011) 2010 - 2012
- Project of the Spanish ministry for research and innovation
 - Basic research on flexible (linear) regression models for imprecise data
- CORRELATE.AT
 PROJECTS
 (INCOMPLETE LIST)
- Grafikprogrammierung** 2021 -
- For IQS
- Coding of specific non-trivial automatable R-graphics
- IPTV pattern detection** 2019
- For A1
- Pattern detection in and classification of IPTV data
 - Graphical illustration of the main results
- HR-Analytics** 2018
- For ÖBB
- Statistical data analysis concerning ten predefined hypotheses
 - Graphical illustration of the main results
- Statistical Data Analysis in Medicine** 2016 - 2017
- For Landeskrankenhaus Amstetten
- Statistical data analysis concerning MAST in obese patients
- Confirmed by customer** 2015
- For T-Mobile Austria
- Hexagonal binning and aggregation of speed measurements by customers
 - Illustration of the results

Breitbandanalyse Bundesland Salzburg (together with SBR-net Consulting AG)

For the province of Salzburg, Austria 2015

- Analysis of the status quo
- Collection, cleaning and aggregation of all relevant data sources on a 100×100 meter grid

Analysis CTU Data

For Specure (as subcontractor in their project with Czech Telecommunication Office) 2015

- Plausibility checking, heavy user filtering, data aggregation and visualization
- Implementation in R and SQL

Opening Hours Illustration

For Stadtgemeinde Baden, Austria 2015

- Analysis of the collected data and summarization of the most important findings in pretty and easy to interpret graphics
- Publication of the results in the *Baden Passion* magazine

CONSULTING &
FREELANCE
EXPERIENCE
(INCOMPLETE LIST)

A1 Telekom Austria, Vienna, Austria 2008 - 2012

- Assistance and support in the development of automated reports for ticket flows
- Data mining radius data
- Simulation and Backtesting Voice/mobile broadband with selectable geographical parameters, Implementation in R
- Development of a Q-Voice sampling plan for Austria based on the geographical distribution of the population, Implementation in R
- Data mining Scanner-data
- Assistance and support in the development of automated mag backbone reports via Sweave
- Assistance and support in the development of automated TEMS reports for all mag countries

Allianz Insurance Austria, Vienna, Austria 2006 - 2010

- Development of a forecasting model for losses caused by hail based on POH grid-data from ZAMG Austria, Implementation in R
- Geographical (meteorological) risk-zoning of Austria concerning natural hazards, Implementation in R
- Development of a stochastic model for flood damages given right-censored historical data, Implementation in SAS and R
- Analysis of the interrelation of empirical flood damages and the Austrian HORA project (HOchwasser Risikozonierung Austria)

EDUCATION

University of Salzburg & Vienna University of Technology

PD, Habilitation in Mathematics, May 2018

- Thesis title: *New perspectives and recent results in dependence modeling and copulas*

PhD, Mathematics, April 2006 (with distinction)

- Thesis title: *Fuzzy Probability Distributions*
- Adviser: Prof. Dr. R. Viertl

MSc, Mathematics, September 2001 (summa cum laude)

- Thesis title: *Iterated Function Systems and Chaos Game*
- Adviser: Prof. Dr. M. Blümlinger

APPOINTMENTS **University of Salzburg**, Salzburg, Austria

Full Professor since 12/2020

- Department of Mathematics
- Basic research, applied projects and teaching in the field of probability theory and statistics

Associate Professor 07/2018 - 11/2020

- Department of Mathematics
- Basic research, applied projects and teaching in the field of probability theory and statistics

Assistant Professor (with qualification agreement) 10/2014 - 06/2018

- Department of Mathematics
- Basic research, applied projects and teaching in the field of probability theory and statistics

Univ.Ass. Postdoc 10/2013 - 09/2014

- Department of Mathematics
- Basic research and teaching in the field of probability theory and statistics

European Centre for Soft Computing, Mieres, Spain

Associate Researcher 01/2011 - 07/2013

- Research Unit for Intelligent Data Analysis
- Basic research in the field of probability theory and statistics: copulas, dependence measures and statistics with imprecise data
- Applied research in statistics/data mining: applied projects with local companies, with emphasis on forecasting problems

Postdoc Researcher 07/2008 - 12/2010

- Research Unit for Intelligent Data Analysis
- Basic research in the field of probability theory and statistics: copulas, dependence measures and statistics with imprecise data
- Applied research in statistics/data mining: applied projects with local companies, with emphasis on forecasting problems

Vienna University of Technology, Vienna, Austria

Postdoc Research Assistant 01/2006 - 06/2008

- Institute for Statistics and Probability Theory
- Research project: Decision-making based on imprecise information, supported by the National Bank of Austria

National Bank of Austria, Vienna, Austria

Employee (part-time, 28 hours/week) 02/2004 - 12/2005

- Balance of Payments Division, Department of Statistics
- Financial Statistics Quality Control

Hutchison H3G ‘Drei’, Vienna, Austria

Employee (part-time, 20 hours/week) 09/2003 - 01/2004

- Department for Regulatory Affairs
- Invoicing and Reporting

University of Vienna, Vienna, Austria

Research Assistant (partially part-time) 11/2001 - 08/2003

- Institute for Mathematics
- Research in Ergodic Theory

LANGUAGE SKILLS Fluent in German and English
Intermediate in Spanish
School level in Latin