CURRICULUM VITAE

Personal Data

Name:	Hannes Leeb
	Ph.D. (Mathematics) University of Salzburg, 1997.
Address:	Department of Statistics, University of Vienna
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Professional Experience

2009 -	Professor of Statistics, Department of Statistics, University of Vienna.
2006 - 2009	Associate Professor of Statistics, Department of Statistics, Yale University.
2003 - 2006	Assistant Professor of Statistics, Department of Statistics, Yale University.
2002 - 2003	Visiting scholar (Max Kade Fellowship) at Yale University, Department of Statistics.
2000 - 2002	Post-doc, Department of Statistics, University of Vienna. Funded by FWF grant P13868-MAT; principal investigator: B.M. Pötscher; research on model selection and statistical inference.
1998 - 2000	Temporary Assistant Professor, Department of Statistics, University of Vienna (re- placement of E. Reschenhofer during his leave of absence).

Funding

- FWF Grant P28233-N32, principal investigator, 2015–2018, €266,742.-.
- FWF Grant P26354, principal investigator, 2014–2018, ${\in}192,\!181.{-}.$
- FWF-DK 'Vienna Graduate School of Economics,' co-investigator, 2010-2014, €2,192,055.-.
- La Trobe University travel grant, 2010.
- University of Vienna startup grant, 2009.
- NIH R1 research grant, co-investigator, 2008-2013.
- Yale University startup grant, 2003.
- Max Kade Fellowship for a one-year research visit to the US, 2002.

Awards & Honors

- 2008: Econometric Theory Multa Scripsit (joint with G. Cavaliere, D. Harris, S. Leybourne and Y. Yang).
- 2007: Austrian Academy of Science's Figdor Award (joint with A. Bogner).
- 2005: Offer of tenured Assistant Professor position at University of Exeter, Department of Economics.
- 1995: Student Promotion Award of the Department of Mathematics, University of Salzburg.

Teaching

- University of Vienna: Basic Principles of Statistics; Asymptotic Statistics; Probability Theory 1 & 2; Nonlinear Regression, Classification, and Machine Learning (lecture and lab-session); Econometrics I (lab-session); Econometrics II (lecture and lab-session); Calculus of Probability (lab-session); Mathematics for Economists (lab-session).
- Yale University: Probability Theory with Applications; Theory of Statistics; Statistical Inference; Data Mining & Machine Learning; Linear Models; Introductory Data Analysis; Random Matrices in Statistics; Information Theory.
- University of Salzburg: Calculus II; Finite Fields; Measure Theory; Mathematical Methods; Mathematical Software (all lab-sessions).
- Fachhochschule für Telekommunikationstechnik und -systeme, Salzburg: Programming in C++ (lab-session); Unix System Programming with PERL (lecture and lab-session).

Research Interests

Inference Post Model Selection; Model Selection in Statistics and Econometrics; Asymptotic Statistics; Analysis of High-Dimensional Data; Random Matrices; Shrinkage-Type Estimators; Linear and Non-Linear Time Series Analysis; Machine Learning.

Current Research

- Model selection and predictive inference when the number of parameters is of the same order as sample size.
- Inference when fitting mis-specified models.
- Admissibility of confidence sets.
- Pitfalls in inference after model selection when using traditional approaches.

Preprints

• Conformal prediction intervals for the individual treatment effect. (With D. Kivaranovic, R. Ristl and M. Posch.) In preparation; arXiv:2006.01474.

Publications

- A (tight) upper bound for the length of confidence intervals with conditional coverage. (With D. Kivaranovic.) *Electron. J. Stat.*, 18:1677–1701, 2024.
- [2] Conditional predictive inference for stable algorithms. (With L. Steinberger.) Ann. Statist., 51:290– 311, 2023.
- [3] Statistical inference with F-statistics when fitting simple models to high-dimensional data. (With L. Steinberger.) Econometric Theory, 39:1249–1272, 2023.
- [4] Expected length of post-model-selection confidence intervals conditional on polyhedral constraints. (With Danijel Kivaranovic.) J. Amer. Statist. Assoc., 116:845–857, 2021.
- [5] Adaptive, distribution-free prediction intervals for deep neural networks. (With D. Kivaranovic and K. Johnson.) 23rd International Conference on Artificial Intelligence and Statistics (AISTATS) 2020, Parlermo, Italy. In *Proceedings of Machine Learning Research*, **108**: 1–10, 2020.
- [6] Discussion on "Model Confidence Bounds for Variable Selection" by Yang Li, Yuetian Luo, Davide Ferrari, Xiaonan Hu, and Yichen Qin. (With D. Kivaranovic and B.M. Pötscher.), *Biometrics*, 75:407–410, 2019.
- [7] Prediction when fitting simple models to high-dimensional data (With L. Steinberger.) Ann. Statist., 47:1408–1442, 2019.
- [8] Valid confidence intervals for post-model-selection predictors. (With F. Bachoc and B.M. Pötscher.) Ann. Statist., 47:1475–1504, 2019.
- [9] On conditional moments of high-dimensional random vectors given lower-dimensional projections. (With L. Steinberger.) Bernoulli, 24:565–591, 2018.
- [10] Admissibility of the usual confidence set for the mean of a univariate or bivariate normal population: The unknown variance case. (With P. Kabaila.) J. R. Stat. Soc. Ser. B Stat. Methodol., 79:801– 813, 2017.
- [11] Testing in the presence of nuisance parameters: Some comments on tests post-model-selection and random critical values. (With B.M. Pötscher.) In S. E. Ahmed, editor, *Big and Complex Data Analysis: Methodologies and Applications*, Springer, 69–82, 2017.
- [12] Discussion: "An adaptive resampling test for detecting the presence of significant predictors" J. Amer. Statist. Assoc., 110:1457–1459, 2015.
- [13] On various confidence intervals after model selection. (With K. Ewald and B.M. Pötscher.) Stat. Sci., 30:216–227, 2015.
- [14] On the conditional distributions of low-dimensional projections from high-dimensional data. Ann. Statist., 41:464–483, 2013.
- [15] Shrinkage estimators for prediction out-of-sample: Conditional performance. (With N. Huber.) Comm. Statist. Theory Methods, 42:1246–1264, 2013.
- [16] Admissibility of the usual confidence interval in linear regression. (With P. Kabaila and K. Giri.) Electron. J. Stat., 4:300–312, 2010.
- [17] Conditional predictive inference post model selection. Ann. Statist., 37:2838–2876, 2009.
- [18] Concentration of the spectral measure of large Wishart matrices with dependent entries. (With A. Guntuboyina.) *Electron. Comm. Probab.*, 14:334–342, 2009.

- [19] On the distribution of penalized maximum likelihood estimators: The LASSO, SCAD, and thresholding. (With B.M. Pötscher.) J. Multivariate Anal., 100:2065–2082, 2009.
- [20] Evaluation and selection of models for out-of-sample prediction when the sample size is small relative to the complexity of the data-generating process. *Bernoulli*, **14**:661–690, 2008.
- [21] Model selection. (With B.M. Pötscher.) In T.G. Andersen et al., editors, Handbook of Financial Time Series, Springer, 785–821, 2008.
- [22] Can one estimate the unconditional distribution of post-model-selection estimators? (With B.M. Pötscher.) Econometric Theory, 24:338–376, 2008.
- [23] Sparse estimators and the oracle property, or the return of Hodge's estimator. (With B.M. Pötscher.) Journal of Econometrics, 142:201–211, 2008.
- [24] Can one estimate the conditional distribution of post-model-selection estimators? (With B.M. Pötscher.) Ann. Statist., 34:2554–2591, 2006.
- [25] On the large-sample minimal coverage probability of confidence intervals after model selection. (With P. Kabaila.) J. Amer. Statist. Assoc., 101: 619–629, 2006.
- [26] The distribution of a linear predictor after model selection: Unconditional finite-sample distributions and asymptotic approximations. *IMS Lecture Notes – Monograph Series*, **49**: 291–311, 2006.
- [27] Performance limits for estimators of the risk or distribution of shrinkage-type estimators, and some general lower risk-bound results. (With B.M. Pötscher.) *Econometric Theory*, 22:69–97, 2006. Correction ibid. 22:581–583, 2008.
- [28] The distribution of a linear predictor after model selection: Conditional finite-sample distributions and asymptotic approximations. *Journal of Statistical Planning and Inference*, **134**:64–89, 2005.
- [29] Model selection and inference: Facts and fiction. (With B.M. Pötscher.) Econometric Theory, 21:21–59, 2005.
- [30] The finite-sample distribution of post-model-selection estimators, and uniform versus non-uniform approximations. (With B.M. Pötscher.) *Econometric Theory*, **19**:100–142, 2003.
- [31] On a differential equation with both advanced and retarded arguments. Communications in Applied Nonlinear Analysis, 9:77-86, 2002.
- [32] Asymptotic properties of the spectral test, diaphony and related quantities. Math. Comp., 71:297– 309, 2002.
- [33] Corrigenda to "New primitive t-nomials (t = 3, 5) over GF(2) whose degree is a Mersenne exponent," and some new primitive pentanomials. (With T. Kumada, Y. Kurita, and M. Matsumoto.) *Math. Comp.*, **71**:1337–1338, 2002.
- [34] The variance of an integrated process need not diverge to infinity and related results on partial sums of stationary processes. (With B.M. Pötscher.) *Econometric Theory*, 17:671–685, 2001.
- [35] Quantification of microvascular networks by SEM of corrosion castings and 3D-morphometry. (With B. Minnich, H. Bartel, E.W.N. Bernroider, W.D. Krautgartner, and A. Lametschwandtner.) *Microscopy and Analysis*, **71**:13–15, 2001.
- [36] New primitive t-nomials (t = 3, 5) over GF(2) whose degree is a Mersenne exponent. (With T. Kumada, Y. Kurita and M. Matsumoto.) Math. Comp., **69**:811–814, 1999.
- [37] Three-dimensional morphometry in scanning electron microscopy. (With B. Minnich, E.W.N. Bernroider and A. Lametschwandtner.) J. Microscopy, 195:23–33, 1999.
- [38] Higher-dimensional properties of non-uniform pseudo-random variates. (With J. Leydold and W. Hörmann.) Monte Carlo and Quasi-Monte Carlo Methods 1998, H. Niederreiter and J. Spanier (eds.), pages 341–355, Springer, Berlin, 1999.
- [39] Neue Darstellungs- und Analysemöglichkeiten von 3D-Elektronendichten. (With K. Steiner, W. Lottermoser, and G. Amthauer.) Zeitschrift für Kristallographie, suppl. 15:200, 1998 (6. Jahrestagung der Deutschen Gesellschaft für Kristallographie).

- [40] Weak limits for the diaphony. Lecture Notes in Stat., 127:330–339, 1998.
- [41] Dyadic diaphony. (With P. Hellekalek.) Acta Arith., 80:187–196, 1997.
- [42] Inversive and linear congruential pseudorandom number generators in empirical tests. (With S. Wegenkittl.) ACM TOMACS, 7:272–286, 1997.

Citations: 2464 total. [3]: -; [4]: 11; [5]: 12; [6]: -; [7]: 4; [8]: 35; [9]: 10; [10]: 4; [11]: 16; [12]: -; [13]: 48; [14]: 15; [15]: 7; [16]: 8; [17]: 36; [18]: 27; [19]: 156; [20]: 32; [21]: 91; [22]: 172; [23]: 209; [24]: 248; [25]: 82; [26]: 26; [27]: 64; [28]: 23; [29]: 676; [30]: 150; [31]: 1; [32]: 9; [33]: 3; [34]: 10; [35]: 6; [36]: 24; [37]: 101; [38]: 7; [39]: 1; [40]: 11; [41]: 56; [42]: 71 (data from google scholar in September 2021).

Invited Presentations

- [1] Duke Statistical Science Seminar, Duke University, Oct. 22, 2021 (virtual).
- [2] Hausdorff School 'High-Dimensional Statistics', University of Bonn, Jul. 26–30, 2021.
- [3] Forschungsseminar Mathematische Statistik, Humboldt University of Berlin, May 19, 2021 (virtual).
- [4] Vienna University of Economics and Business, Nov. 6, 2020 (virtual).
- [5] International Seminar on Selective Inference, Sep. 17, 2020 (virtual).
- [6] University of Oxford, May 15, 2020 (virtual).
- [7] Erasmus University, Rotterdam, Nov. 1, 2018.
- [8] Workshop 'Model Selection, Regularization, and Inference,' Jul. 12-14, 2018, University of Vienna.
- [9] Workshop on Higher-Order Asymptotics and Post-Selection Inference, Aug. 12–14, 2017, Washington University in St. Louis.
- [10] Workshop on Model Selection, Sep. 8, 2016, KU Leuven.
- [11] Georg-August-University Göttingen, Nov. 11, 2015.
- [12] 30th European Meeting of Statisticians, Jul. 6-10, 2015, Amsterdam.
- [13] TU Dortmund, May 5, 2015.
- [14] Workshop on Statistical Inference for Large Scale Data, Vancouver, Apr. 20–24, 2015.
- [15] University of Mannheim, Feb. 17, 2015.
- [16] Cambridge University, Nov. 12, 2014.
- [17] University of Zurich & ETH Zurich, Zurich, Oct. 10, 2014.
- [18] ASC & IMS Annual Meeting, Sydney, Jul. 7–10, 2014.
- [19] University of Bremen, May 27, 2014.
- [20] 7th International Conference on Computational and Financial Econometrics (CFE 2013), University of London, Dec. 14-16, 2013.
- [21] Workshop in honor of Jan Magnus' valedictory address, Tilburg University, Jun. 13–14, 2013.
- [22] Yale University, Apr. 29, 2013.
- [23] The Wharton School, University of Pennsylvania, Apr. 24, 2013.
- [24] Rutgers University, Apr. 11, 2013.
- [25] CFE Workshop Foundations for Ockham's Razor, Carnegie Mellon University, Jun. 22–24, 2012.
- [26] Perspectives on High-dimensional Data Analysis II, Montreal, May 30, 2012.
- [27] ECARES, Free University of Brussels, May 10, 2012.
- [28] The 58th Session of the International Statistical Institute, Aug. 21–26, 2011, Dublin, Ireland.
- [29] Nonparametrics and Geometry, Prague, Aug. 15–19, 2011.

- [30] La Trobe University, Melbourne, Dec. 2, 2010.
- [31] Workshop on non-standard confidence and prediction regions, Melbourne, Nov. 29, 2010.
- [32] Annual Meeting of the German Statistical Society, Nuremberg, Sep. 14–17, 2010.
- [33] University of Göttingen, May 19, 2010.
- [34] Resampling Methods and High Dimensional Data, March 25–26, 2010, College Station, TX.
- [35] Cambridge University, Dec. 04, 2009.
- [36] Tilburg University, Nov. 25, 2009.
- [37] The 57th Session of the International Statistical Institute, Aug. 16–22, 2009, Durban, South Africa.
- [38] 2009 Joint Statistical Meetings, Aug. 1–6, 2009, Washingon, DC.
- [39] Columbia University, Feb. 16, 2009.
- [40] University of Chicago, Feb. 2, 2009.
- [41] Harvard University, Jan. 5, 2009.
- [42] Carnegie Mellon University, Dec. 8, 2008.
- [43] New York University, Oct. 17, 2008.
- [44] Banff International Research Station, Sep. 16, 2008.
- [45] Workshop 'Current Trends and Challenges In Model Selection And Related Areas,' Jul. 25, 2008, University of Vienna.
- [46] Arsenal Research, Vienna, Jul. 22, 2008.
- [47] Department of Statistics, University of California at Los Angeles, Nov. 20, 2007.
- [48] The Greater NY Metropolitan Econometrics Colloquium, University of Pennsylvania, Dec. 1, 2007.
- [49] Mathematisches Forschungsinstitut Oberwolfach, Oct. 25, 2007.
- [50] Department of Mathematics, University of Connecticut, Apr. 27, 2007.
- [51] Institute of Advanced Studies, Vienna, Jan. 26, 2007.
- [52] Department of Mathematics, Humboldt University Berlin, Jan. 12, 2007.
- [53] Department of Statistics, University of Vienna, Dec. 13, 2006.
- [54] Department of Statistics, University of Michigan, Ann Arbor, Mar. 24, 2006.
- [55] Joint Program on Survey Methodology, University of Maryland at College Park, Feb. 24, 2006.
- [56] Department of Mathematics, University of Maryland at College Park, Feb. 23, 2006.
- [57] Department of Statistics, University of Connecticut, Sep. 11, 2005.
- [58] Department of Statistics, Yale University, Oct. 17, 2005.
- [59] Department of Statistics, University of Vienna, Jun. 27, 2005.
- [60] Department of Economics, University of Exeter, Jun. 21, 2005.
- [61] Department of Economics, University of Pittsburgh, Mar. 25, 2005.
- [62] Department of Statistics, The Wharton School, University of Pennsylvania, Mar. 2, 2005.
- [63] Department of Statistics, Columbia University, Sep. 13, 2004.
- [64] 2004 Joint Statistical Meetings, Aug. 8-12, 2004, Toronto, Canada.
- [65] Department of Statistics, Technical University Graz, Jun. 28, 2004.
- [66] Department of Mathematics, University of Salzburg, Jun. 24, 2004.
- [67] ASA Connecticut Chapter Meeting, May 13, 2004.
- [68] Department of Statistics, University of Vienna, Nov. 24, 2003.

- [69] Department of Economics, Yale University, Feb. 26, 2003.
- [70] Department of Statistics, Yale University, Feb. 24, 2003.
- [71] Department of Statistics, University of California at Davis, Feb. 10, 2003.
- [72] Department of Statistics, Yale University, Oct. 14, 2002.
- [73] Department of Mathematics, University of Salzburg, Jun. 29, 2001.
- [74] Department of Statistics, Yale University, Apr. 13, 2001.
- [75] Department of Mathematics, TU Darmstadt, Oct. 14, 1998.
- [76] Department of Statistics, Vienna University of Economics and Business Admin., Jan. 27, 1998.
- [77] Department of Statistics, University of Montreal, Oct. 10, 1996.

Contributed Presentations

- [78] 2015 Joint Statistical Meetings, Aug. 8–13, 2015, Seattle, WA.
- [79] 29th European Meeting of Statisticians, Jul. 20–25, 2013, Budapest.
- [80] 8th World Congress in Probability and Statistics, Jul. 9 14, 2012, Istanbul.
- [81] Workshop 'Statistical Inference in Complex/High-Dimensional Problems,' University of Vienna, Jul. 4 - 6, 2012.
- [82] Australian Statistical Conference, Dec. 6 10, 2010, Perth.
- [83] Department of Statistics, Yale University, Oct. 8, 2007.
- [84] 2007 Joint Statistical Meetings, Jul. 29 Aug. 2, 2007, Salt Lake City, UT.
- [85] The Second Erich L. Lehmann Symposium, May 19-22, 2004, Houston, TX.
- [86] 24rd European Meeting of Statisticians, Aug., 19-23, 2002, Prague, Czech Republic.
- [87] Perspectives in Modern Statistical Inference II, Aug., 14–17, 2002, Brno, Czech Republic.
- [88] Statistiktage 2001, Oct. 16–19, 2001, Vienna, Austria.
- [89] 23rd European Meeting Of Statisticians, Aug. 13–19, 2001, Madeira, Portugal.
- [90] MRSI Workshop on Nonlinear Estimation And Classification, Mar. 19–29, 2001, Berkeley, CA.
- [91] HSSS Workshop on Bias Reduction And Confidence Estimation In Complex Models, Jun. 1–3, 2000, Lillesand, Norway.
- [92] Department of Statistics, University of Vienna, Mar. 27, 2000.
- [93] Fourth Meeting of Austrian, Slovenian, Italian and Hungarian Young Statisticians, Oct. 8–10, 1999, Péc, Hungary.
- [94] 1999 Joint Statistical Meetings, Aug. 8–12, 1999, Baltimore, MD.
- [95] Fourth North American Meeting Of New Researchers, Aug. 4–7, 1999, Baltimore, MD.
- [96] Third International Conference on Monte Carlo And Quasi-Monte Carlo Methods In Scientific Computing, Jun. 22–26, 1998, Claremont Colleges, Claremont, CA.
- [97] XIV. Congress of the Austrian Mathematical Society, Sep. 22–26, 1997, Salzburg, Austria.
- [98] Open Seminar of Working Group 9, February 5, 1997, Department of Mathematics, TU Darmstadt, Feb. 5, 1997.
- [99] Second International Conference on Monte Carlo And Quasi-Monte Carlo Methods In Scientific Computing, Jul. 9–12, 1996, University of Salzburg, Austria.
- [100] Extended Workshop on Pseudorandom Number Generation, Jun. 3–21, 1996, University of Montreal, Canada.

- [101] Workshop "Pseudozufallszahlen". Feb. 1, 1996, Technische Hochschule Darmstadt, Germany.
- [102] Minisymposium on Mathematical Statistics and "Austrian Stochastics Days" Mar. 20–24, 1995, University of Vienna, Austria.
- [103] 1st Salzburg Minisymposium on Pseudorandom Number Generation And Quasi-Monte Carlo Methods, Nov. 18, 1994, University of Salzburg, Austria.
- [104] International Workshop Parallel Numerics 94, Sep. 19–21, 1994, Smolenice Castle, Slovakia.

Ph.D. Students

- Nina Senitschnig, 2013.
- Lukas Steinberger, 2015.
- Ivana Milovic, 2016.
- Danijel Kivaranovic, 2021.
- Nicolai Amann, 2023.

Master's Students

- Karl Ewald, 2012.
- Mario Caputo, 2017.
- Danijel Kivaranovic, 2017.
- Manuel Hahn, 2020.
- Manuel Müller, 2021.
- Julia Heyne (Management), 2023.
- Dmytro Rzhemovskyi, 2023.

Other Professional Activities

- Vice dean (research) of the Faculty of Economics, Business and Statistics, University of Vienna, 2020 2022.
- Department head, Department of Statistics, Univ. Vienna, 2014 2016.
- Bernoulli Society, European Regional Committee, 2013 2015.
- Co-editor Sankhya A, 2012 2015.
- Director of graduate studies, Department of Statistics, Univ. Vienna, 2012 2013.
- Organization of a workshop on model selection and inference in complex/high-dimensional problems, 2011.
- Yale College Committee on Majors, 2007 2009.
- Departmental seminar organizer: Department of Statistics, Yale University; 2003 2006. Department of Statistics and Operations Research, University of Vienna; 2011 2014.

- Organization of a workshop on model selection and related regularization techniques, 2008.
- Reviewer for NSF in 2007 and panellist 2008.
- Guest editor of the Econometric Theory Special Issue on recent developments in model selection and related areas, 2006 2007.
- Reviewer for National Science Foundation (USA); US-Israel Binational Science Foundation; Israel Science Foundation; Fonds Wetenschappelijk Onderzoek Vlaanderen (Belgium); Fonds zur Förderung der Wissenschaftlichen Forschung (Austria); Netherlands Organisation for Scientific Research.
- Referee for scientific journals: ACM TOMACS, Annals of Statistics, Australian Journal of Statistics, Automatica, Biometrika, Biometrical Journal, Canadian Journal of Statistics, Communications in Statistics – Theory and Methods, Computational Statistics, Econometrica, Econometric Theory, Electronic Journal of Statistics, European Journal of Operational Research, IEEE Transactions on Information Theory, IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Computers, IMS Lecture Notes, International Statistical Review, Journal of Econometrics, Journal of Multivariate Analysis, Journal of Statistical Planning and Inference, Journal of the American Statistical Association, Journal of Time Series Analysis, Lecture Notes in Statistics, Mathematics of Computation, Operations Research, Österreichische Zeitschrift für Statistik, Scandinavian Journal of Statistics, Test.

Visits

- University of Pennsylvania, Department of Statistics, April 2013.
- Rutgers University, Department of Statistics, April 2013.
- La Trobe University, Department of Mathematics, December 2010.
- University of Vienna, Department of Statistics, May July 2005.
- Yale University, Department of Statistics, October 2002 June 2003.
- GERAD École des Hautes Études Commerciales, Montréal, June 1997.
- Technische Hochschule Darmstadt, February 1997.
- University of Montreal, September October 1996.