ANNUAL REPORT
2021

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1   Foreword

I am pleased to present the Annual Report of the Department of Statistics and Operations Research, which documents some of the many achievements in 2021. The Department of Statistics and Operations Research is part of the Faculty of Business, Economics, and Statistics of the University of Vienna. Faculty members are active in research in various fields of Statistics, Econometrics, Operations Research, Applied Mathematics, and Computer Science. The department offers degree programs in Statistics at the Bachelor, Master, and PhD-level. Members of the department are also active in service teaching for other departments of the faculty, including the Department of Business Administration and the Department of Economics.

In 2021 Gianluca Finocchio, Luca Gonzato, Michael Kahr, and Georg Keilbar took up their post-doc positions. We are very much delighted to welcome all of them in our team. New PhD students (prae-docs) starting in 2021 are Benedict Bauer, Yuan Chen, Camilla Damian, Christoph Gerstenecker, Florian Huber, Georg Köstenberger, Janka Möller, and Stefan Rigger. We wish them success in their studies. Soheil Nejadi joined us as system administrator.

There were also several departures in 2021: Jérémy Leymarie, Ivana Ljubic, Sara Papariello-Svaluto-Ferro, Mathias Pohl, and Fabio Tonti left our department. Markus Gabl, Michael Kahr, and Danijel Kivaranovic successfully defended their thesis and graduated from the PhD Programme in Statistics and Operations Research. Julia Brandstätter, Lisa Carli, Rolf Karner, and Martin Marktl left our department. We wish them all well in their new endeavours.

I would like to express special thanks to Vera Lehmwald and Manuela Nicham-Zorn for editing the Annual Report 2021.

Benedikt Pötscher

(Head of Department)

Vienna, April 2022

2 Faculty and Staff

Faculty

Ilya Archakov (Dr.)	Financial Econometrics
Immanuel Bomze (Prof.)	Operations Research and Quantitative Decision Support, Game Theory and Modelling of Behaviour, Optimization Theory and Application, Asymptotic Statistics, Stochastic Modelling, Dynamical Systems
Christa Cuchiero (Prof.)	Mathematical Finance and Quantitative Risk Management (Data Driven Risk Inference, Stochastic Volatility, Stochastic Portfolio Theory, Robust Portfolio Optimization, Arbitrage Theory, Interest Rate Theory, Systemic Risk), Machine Learning in Finance and Economics, Stochastic Processes in Finite and Infinite Dimensions, McKean Vlasov Equations, Interacting Particle Systems and Mean Field Games , Statistics of Stochastic Processes, Statistics with High-Frequency Data, Covariance Estimation, Robust Model Calibration, Universal Approximation Theorems in Dynamic Situations
Solomiia Dmytriv (Dr.)	High-Dimensional Statistics and Random Matrix Theory, Statistical Inference, Portfolio Optimization
Gianluca Finocchio (Dr.)	Partial Least Squares for Classification, Bayesian Statistics, Neural Networks, Empirical Processes, Robust Estimation
Luca Gonzato (Dr.)	Financial Econometrics, Sequential Monte Carlo Methods, Option Pricing, Stochastic Volatility Models
Nikolaus Hautsch (Prof.)	Financial Econometrics, Econometric Modelling of Financial High-Frequency Data, Time Series Econometrics, Time-Varying Volatility and Correlation, Market Liquidity, Market Microstructure Analysis, Systemic Risk, Information Processing on Financial Markets, Risk Management
Michael Kahr (PhD)	(Mixed) Integer Linear Programming, Stochastic and Robust Optimization, Conic Optimization, Network Optimization
Johannes Moritz Jirak (Prof.)	High-Dimensional Statistics, Principal Component Analysis, High Frequency Analysis, Time Series Analysis, Nonparametric, Irregular Models

Georg Keilbar (PhD)	Non- and Semiparametric Statistics, Quantile Regression, Machine Learning
Irene Klein (Assoc. Prof.)	Stochastic Finance
Peter Kramlinger (Dr.)	Statistical Inference, Mixed Effect Models, Small Area Estimation
Tatyana Krivobokova (Prof.)	Non-Parametric and Bayesian Modelling and Inference, Dimension Reductions Techniques, Modelling of Dependent and Complex Data with Applications in Biophysics and Economics
Hannes Leeb (Prof.)	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
Jérémy Leymarie (Dr.)	
Ivana Ljubic (Ass. Prof., on leave)	Algorithmic Operations Research, Algorithm Engineering
Sara Papariello-Svaluto-Ferro (Dr.)	Stochastic Analysis, High Dimensional Jump-Diffusions, Signature Processes, Duality Methods for Stochastic Processes, Stochastic Optimal Control
Mathias Pohl (PhD)	Dependence Modeling and Copulas, High Frequency Trading, Model Ambiguity, Optimal Transport, Portfolio Optimization, Robust Optimization
Benedikt Pötscher (Prof.)	Econometrics, Statistics, Time Series Analysis
Erhard Reschenhofer (Assoc. Prof.)	Time Series Analysis, Financial Econometrics, Automatic Model Selection
Werner Schachinger (Assoc. Prof.)	Optimization, Probabilistic Analysis of Algorithms
Lukas Steinberger (Ass.-Prof.)	Statistical Inference under Differential Privacy, High-Dimensional Data Analysis, Predictive Inference, Model Selection, Statistical vs. Computational Efficiency

Retired Faculty

Walter J. Gutjahr (Prof.)	Optimization Theory, Discrete Optimization, Stochastic Modeling, Multicriteria Decision Analysis
Georg Pflug (Prof.)	Mathematical Statistics, Stochastic Optimization, Risk Management

PhD Students

Nicolai Amann (Dipl.-Ing.) Predictive Inference & Model Selection in High-Dimensional Linear Models

Benedict Bauer (MSc) Gaussian Processes, Large Deviations in Rough Volatility Models, Schrödinger Bridges

Xandro Bayer (MSc) Machine Learning with Applications in Finance

Yuan Chen (MSc) Financial Econometrics and Portfolio Management

Camilla Damian (MSc)

Markus Gabl (MSc) Copositive Optimization, Quadratic Optimization, Conic Optimization, Robust Optimization

Guido Gazzani (M.Sc.) Machine Learning in Finance, Robust Calibration, Robust Risk Assessment

Christoph Gerstenecker (Dipl.-Ing.) Rough Volatility, Large Deviations, Stochastic Volterra Integral Equations

Florian Huber (Dipl.-Ing.) Stochastic Partial Differential Equations, Interacting Particle Systems, Rough Paths

Fabio Kalix (MSc) Weak Dependence, High-Dimensional Limit Theorems and Quantitative Bounds, Bootstrap

Danijel Kivaranovic (Mag.) Inference Post-Model-Selection, Predictive Inference with Machine Learning Algorithms

Karolina Klockmann (M.Sc.) Non-Parametric Bayesian Modelling and Inference, Covariance Matrix Estimation

Georg Köstenberger (Dipl. Ing.) High-Dimensional Statistics, Random Matrix Theory, Topological Properties of Stochastic Processes

Manveer Mangat (MSc) Times Series Analysis, Financial Econometrics

Janka Möller (MSc) Machine Learning in Finance, Stochastic Portfolio Theory

Bo Peng (MSc) Convex and Nonsmooth Optimization, Conic Relaxations for MINLP

Francesca Primavera (Dott.) Stochastic Modeling, Mathematical Finance

Stefan Rigger (Dipl.-Ing.) Interacting Particle Systems, McKean-Vlasov problems, Mean Field Limits and Mean Field Games

Thomas Stark (Mag.) Time Series Analysis, Financial Econometrics

Fabio Elio Tonti (Dr.)	Dimension Reduction for Classification of Particle Systems, Time Series Classification, Applications of Spatio-Temporal Point Processes
Christian Zwatz (Mag.)	Autocorrelation Robust Testing, Spatial Econometrics

External Lecturers (Academic Year 2020/2021)

Andreas Baierl (Univ. Vienna), Johann Brandstetter (Univ. Vienna), Cordula Eggert (Univ. Vienna), Florian Frommlet (MedUni Vienna), Annemarie Grass (Univ. Vienna), Sándor Guzmics (Univ. Vienna), Michael Jakl (Univ. Vienna), Raimund Kovacevic (TU Vienna), Christoph Krall (Univ. Vienna), Ivana Milovic (Univ. Vienna), Stefan Rigger (Univ. Vienna), Robin Ristl (Univ. Vienna), Theresa Scharl-Hirsch (BOKU Vienna), Uygar Senocak (Univ. Vienna), Leopold Sögner (Institute for Advanced Studies Vienna), Alexander Tichy (VetMedUni Vienna), Bertram Tschiderer (Univ. Vienna), Gabriele Uchida (Univ. Vienna), Claus Vogl (VetMedUni Vienna), Bertram Wassermann (Univ. Vienna)

Teaching Assistants (Academic Year 2020/2021)

Georgi Atanasov, Anja Bohatschek, Julian Feurhuber, Johanna Fritz, Georg Goldenits, Tobias Krause, Karol Kulma, Azadeh Sadat Mirtaheri, Marlene Steiner, Lusine Yeghiazaryan

Administrative Assistants

Julia Brandstätter, Lisa Carli, Birgit Ewald, Vera Lehmwald, Manuela Nicham-Zorn, Sabine Sobotka-Tompits

System Administrators

Stefan Geißler, Rolf Karner, Andreas Loibl, Martin Marktl, Svetlana Mihajlovic, Soheil Nejadi

3   Visitors

Peter Reinhard Hansen (Univ. North Carolina, Chapel Hill), Wahid Khosrawi (ETH Zurich), Josef Teichmann (ETH Zurich)

4   Teaching

Theses Supervised

PhD Theses in Progress

Supervisor	Author	Title
Immanuel Bomze (2nd supervisor), Alice Vadrot	Paul Dunshirn	Exploring collective action problems in the governance of marine genetic resources beyond national jurisdiction
Immanuel Bomze	Philipp Hungerländer	Extensions of the Traveling Salesman Problem
Immanuel Bomze	Bo Peng	Conic Optimization and MINLP for sparsity models in analytics
Immanuel Bomze (2nd supervisor), João Alves, Torsten Möller (all Research Network Data Science)	Sebastian Ratzenböck	Data Science techniques in Astronomy
Christa Cuchiero, Stefan Gerhold (TU Vienna)	Benedict Bauer	Aspects of rough volatility modeling: from Gaussian Markov processes to VIX option calibration via large deviations principles and Schrödinger bridges
Christa Cuchiero, Zehra Eksi (WU Vienna)	Eva Flonner	Bayesian and Machine Learning Methods for Calibration and Estimation of Financial Models
Christa Cuchiero, Irene Klein	Guido Gazzani	Dynamic Uncertainty modeling in finance
Christa Cuchiero, Luca di Persio (Univ. Trento and Verona)	Francesco Guida	Measure-valued affine and polynomial diffusions and applications to energy modeling
Christa Cuchiero (2nd supervisor)	Kevin Kurt (WU Vienna)	TBA
Christa Cuchiero	Janka Möller	Signature methods for stochastic portfolio theory
Christa Cuchiero, Josef Teichmann (Scuola Normale Superiore, Pisa)	Tonio Möllmann	Generalized Feller processes and application to affine and polynomial processes
Christa Cuchiero	Francesca Primavera	Signature methods from a polynomial and affine point of view

Christa Cuchiero	Stefan Rigger	Singular McKean Vlasov equations and supercooled Stefan problems
Nikolaus Hautsch	Xandro Bayer	TBA
Nikolaus Hautsch	Yuan Chen	TBA
Johannes Moritz Jirak	Fabio Kalix	TBD
Johannes Moritz Jirak	Georg Köstenberger	TBD
Tatyana Krivobokova	Karolina Klockmann	Bayesian nonparametric adaptive estimation of Toeplitz covariance matrices
Hannes Leeb, Lukas Steinberger	Nicolai Amann	Conditional predictive inference for linear sub-models of high-dimensional data
Markus Leitner, Ivana Ljubic	Georg Brandstätter	Strategic Optimization of Electric Car Sharing Systems
Georg Pflug	Sándor Guzmics	Freund copula and extensions
Benedikt M. Pötscher	Christian Zwatz	Size and Power Properties of Heteroskedasticity and Autocorrelation Robust Tests in Spatial Error Models
Erhard Reschenhofer	Manveer K. Mangat	Essays on volatility forecasting and directional forecasting based on long-range dependence
Erhard Reschenhofer, Lukas Steinberger	Thomas Stark	High dimensional prediction analysis for gradient descent applied to ridge regression

PhD Theses finished

Supervisor	Author	Title
Immanuel Bomze	Markus Gabl	Conic and Quadratic Optimization tools for Optimization under Uncertainty
Immanuel Bomze, Markus Leitner	Michael Kahr	Mathematical optimization for social network analysis: Influence maximization and community detection
Hannes Leeb	Danijel Kivaranovic	Statistical analysis and development of inference procedures post-model-selection

Master Theses in Progress

Supervisor	Author	Title
Immanuel Bomze	Daniel Karas	Covid-19 epidemiology: contact modelling using local demographic and employment data
Immanuel Bomze	Dejan Kuzmanovic	Preprocessing tools for testing copositivity: empirical evidence
Immanuel Bomze	Sandra Ines Peer	Extended trust region problem and their copositive relaxation: a simulation study
Christa Cuchiero	Abdiu Fation	The effects of inclusion and exclusion of the German midcap index on stock returns
Christa Cuchiero	Fabian Horacek	Machine learning techniques for nested Monte Carlo simulations
Christa Cuchiero	Florian Redl	Deep reinforcement learning for games
Christa Cuchiero	Roman Solntsev	Forcasting Realized Volatility on the Example of the ATX
Nikolaus Hautsch	Julian Feurhuber	Intraday Dynamics of Option-Implied Variance
Nikolaus Hautsch	Tobias Forster	Intraday-Preisprognose am Strommarkt
Nikolaus Hautsch	Yelena Holzer	Trading Frictions and Arbitrage in the Bitcoin Market
Nikolaus Hautsch	Benjamin Jaquemar	Modelling Bitcoin Volatility
Nikolaus Hautsch	Azar Karimov	Minimum Quantity at Touch and its effects on market microstructure
Nikolaus Hautsch	Zhuxi Pang	Will the outbreak of Coronavirus disease (COVID-19) affect the stock markets of infected countries?
Nikolaus Hautsch	Lukas Pichlmann	Automated stock trading using deep reinforcement learning
Nikolaus Hautsch	Robert Reuter	The pulse of the stock market
Nikolaus Hautsch	David Sandahl and Mathias Axel Broman	Optimal Number of Portfolio Holdings for Small Cap Mutual Funds – An Analysis of Diversification Benefits and Costs
Hannes Leeb	Dmytro Rzhemovskyi	Conformal prediction
Werner Schachinger	Rafael Jochum	Verzweigungsprozesse – Theorie und Anwendung

Werner Schachinger	Simon Klima	Random Graphs and the Giant Component
Lukas Steinberger	Maximilian Pfeiffer	Predicting photo voltaic energy production based on weather data
Lukas Steinberger	Natalie Schmerlaib	An R-based pipeline for routine analysis of mass spectrometry data

Master Theses Finished

Supervisor	Author	Title
Immanuel Bomze	Anja Bohatschek	Entwicklung und Entstehung der Isotype von Otto Neurath sowie Vergleich zum aktuellen Regelwerk zur Erstellung von Bildstatistiken
Immanuel Bomze, Stefan Pickl	Theresa Loreth	Business Continuity Management in Times of Crisis
Walter J. Gutjahr	Judith Feltl	Inequity-averse two-stage location decision making processes
Irene Klein	Azadeh Sadat Mirtaheri	Trading with restricted information
Irene Klein	Mariia Nikonova	Risikomaße und Aufteilung des Risikos unter Modellunsicherheit
Hannes Leeb	Manuel Müller	The convergence rate of stochastic gradient descent
Erhard Reschenhofer	Anja Simicevic	Back-testing value-at-risk

Bachelor Theses

Christa Cuchiero (3), Johannes Moritz Jirak (6), Irene Klein (4), Tatyana Krivobokova (3), Mathias Pohl (1), Benedikt M. Pötscher (1)

5   Publications

Journal Articles

Amann, N. & Schneider, U.: Uniform Asymptotics and confidence regions based on the adaptive Lasso with partially consistent tuning, 2021, (Elektronische Veröffentlichung vor Drucklegung) in: Econometric Theory. S. 1-26

Andersen, T. G., Archakov, I., Grund, L. E., Hautsch, N., Li, Y., Nasekin, S., Nolte, I., Pham, M. C., Taylor, S. & Todorov, V.: Descriptive Study of High-Frequency Trade and Quote Option Data, 2021, in: Journal of Financial Econometrics. 19, 1, S. 128-177

Archakov, I. & Hansen, P. R.: A New Parametrization of Correlation Matrices, 2021, in: Econometrica. 89, 4, S. 1699-1715

Bomze, I., Schachinger, W. & Weibull, J.: Does moral play equilibrate?, 2021, in: Economic Theory. 71, 1, S. 305-315

Bomze, I., Rinaldi, F. & Zeffiro, D.: Fast cluster detection in networks by first-order optimization, 2021, (Elektronische Veröffentlichung vor Drucklegung) in: SIAM Journal on Mathematics of Data Science

Bomze, I., Rinaldi, F. & Zeffiro, D.: Frank–Wolfe and friends: a journey into projection-free first-order optimization methods, 2021, in: 4 OR. 19, S. 313-345

Bomze, I. & Gabl, M.: Interplay of non-convex quadratically constrained problems with adjustable robust optimization, 2021, in: Mathematical Methods of Operations Research. 93, S. 115-151

Bomze, I., Kahr, M. & Leitner, M.: Trust Your Data or Not—StQP Remains StQP: Community Detection via Robust Standard Quadratic Optimization, 2021, in: Mathematics of Operations Research. 46, 1, S. 301-316

Bomze, I. & Gabl, M.: Uncertainty preferences in robust mixed-integer linear optimization with endogenous uncertainty, 2021, (Angenommen/In Druck) in: SIAM Journal on Optimization

Bomze, I., Gabl, M., Maggioni, F. & Pflug, G.: Two-stage stochastic standard quadratic optimization, 2021, (Elektronische Veröffentlichung vor Drucklegung) in: European Journal of Operational Research. 299, 1, S. 21-34

Braune, R., Gutjahr, W. J.,Vogl, P.: Stochastic radiotherapy appointment scheduling, 2021, in: Central European Journal of Operations Research

Cuchiero, C., Gonon, L., Grigoryeva, L., Ortega, J-P. & Teichmann, J.: Discrete-time signatures and randomness in reservoir computing, 2021, in: IEEE transactions on neural networks and learning systems

Cuchiero, C. & Papariello-Svaluto-Ferro, S.: Infinite dimensional polynomial processes, 2021, in: Finance and Stochastics. 25, 2, S. 383-426

Dmytriv, S., Bodnar, T., Okhrin, Y., Parolya, N. & Schmid, W.: Statistical Inference for the Expected Utility Portfolio in High Dimensions, 2021, in: IEEE transactions on signal processing. 69

Gould, M., Hautsch, N., Howison, S. D. & Porter, M. A.: Counterparty credit limits: An effective tool for mitigating counterparty risk?, 2021, (Angenommen/In Druck) in: Applied Mathematical Finance

Gutjahr, W.: Inequity-averse stochastic decision processes, 2021, in: European Journal of Operational Research. 288, 1, S. 258-270

Jaber, E. A., Cuchiero, C., Larsson, M. & Pulido, S.: A weak solution theory for stochastic Volterra equations of convolution type, 2021, in: Annals of Applied Probability. 31, 6, S. 2924-2952

Jirak, J. M., Wu, W. B. & Zhao, O.: Sharp connections between Berry-Esseen characteristics and Edgeworth expansions for stationary processes, 2021, in: Transactions of the American Mathematical Society. 374, S. 4129-4183

Jomrich, G., Paireder, M., Kristo, I., Baierl, A., Ilhan-Mutlu, A., Preusser, M., Asari, R. & Schoppmann, S. F.: High Systemic Immune-Inflammation Index is an Adverse Prognostic Factor for Patients With Gastroesophageal Adenocarcinoma, 2021, in: Annals of Surgery. 273, 3, S. 532-541

Kahr, M., Leitner, M., Ruthmair, M. & Sinnl, M.: Benders decomposition for competitive influence maximization in (social) networks, 2021, in: Omega. 100, 102264

Keilbar, G. & Wang, W.: Modelling systemic risk using neural network quantile regression, 2021, in: Empirical Economics: a quarterly journal of the Institute for Advanced Studies, Vienna. 62, S. 93-118

Keilbar, G. & Zhang, Y.: On cointegration and cryptocurrency dynamics, 2021, in: Digital finance: smart data analytics, investment innovation, and financial technology. 3, S. 1-23

Kivaranovic, D. & Leeb, H.: Expected length of post-model-selection confidence intervals conditional on polyhedral constraints, 2021, in: Journal of the American Statistical Association. 116, 534, S. 845-857

Leeb, H. & Steinberger, L.: Statistical inference with F-statistics when fitting simple models to high-dimensional data, 2021, (Elektronische Veröffentlichung vor Drucklegung) in: Econometric Theory

Liu, H., Tatano, H., Pflug, G. & Hochrainer, S.: Post-disaster Recovery in Industrial Sectors: A Markov Process Analysis of Multiple Lifeline Disruptions, 2021, in: Reliability Engineering and System Safety. 206, 107299

Maniezzo, V., Boschetti, M. & Gutjahr, W.: Stochastic premarshalling of block stacking warehouses, 2021, in: Omega. 102, 102336

Nazemi, N., Parragh, S. & Gutjahr, W.: Bi-objective facility location under uncertainty with an application in last-mile disaster relief, 2021, (Elektronische Veröffentlichung vor Drucklegung) in: Annals of Operations Research

Parragh, S., Tricoire, F. & Gutjahr, W.: A branch-and-Benders-cut algorithm for a bi-objective stochastic facility location problem, 2021, (Elektronische Veröffentlichung vor Drucklegung) in: OR Spectrum

Pflug, G., Hochrainer, S., Canedo Rosso, C., Berndtsson, R. & Condori, B.: Drought impact in the Bolivian Altiplano agriculture associated with El Niño Southern Oscillation using satellite imagery data, 2021, in: Natural Hazards and Earth System Sciences. 21, 3, S. 995-1010

Pötscher, B. M., Preinerstorfer, D.: How Reliable are Bootstrap-based Heteroskedasticity Robust Tests?, 2021, in: Econometric Theory, forthcoming

Reschenhofer, E. & Mangat, M.: Detecting long-range dependence with truncated ratios of periodogram ordinates, 2021, in: Communications in Statistics - Theory and Methods. 50, 15, S. 3645-3660

Reschenhofer, E. & Mangat, M.: Fast computation and practical use of amplitudes at non-Fourier frequencies, 2021, in: Computational Statistics. 36, 4, S. 1755-1773

Schneider, L. F., Krajina, A. & Krivobokova, T.: Threshold selection in univariate extreme value analysis, 2021, in: Extremes. 24, S. 881-913

Contributions to Proceedings and Edited Books

Finocchio, G.: Two perspectives on high-dimensional estimation Problems: Posterior contraction and median-of-means (PhD Theses published), 2021, Enschede: University of Twente. 160 S.

Trabs, M., Jirak, J. M., Krenz, K. & Reiß, M.: Statistik und maschinelles Lernen: Eine mathematische Einführung in klassische und moderne Methoden, 2021, 1 Aufl. Berlin, Heidelberg: Springer Spektrum. 263 S.

Working Papers

Allan, A. L., Cuchiero, C., Liu, C. & Prömel, D. J.: Model-free Portfolio Theory: A Rough Path Approach, 2021, (Eingereicht)

Cuchiero, C., Guida, F., Persio, L. D. & Svaluto-Ferro, S.: Measure-valued affine and polynomial diffusions, 2021, (Eingereicht)

Cuchiero, C., Reisinger, C. & Rigger, S.: Optimal bailout strategies resulting from the drift controlled supercooled Stefan problem, 2021, (Eingereicht)

Finocchio, G. & Schmidt-Hieber, J.: Posterior contraction for deep Gaussian process priors, 2021, (In Vorbereitung)

Finocchio, G., Derumigny, A. & Proksch, K.: Robust-to-outliers square-root LASSO, simultaneous inference with a MOM approach, 2021, (In Vorbereitung)

Jirak, J. M.: Edgeworth expansions for volatility models, 2021, (In Vorbereitung)

Kramlinger, P., Krivobokova, T. & Sperlich, S.: Marginal and Conditional Multiple Inference for Linear Mixed Model Predictors, 2021, (In Vorbereitung)

Kramlinger, P., Schneider, U. & Krivobokova, T.: Uniformly valid inference based on the Lasso in linear mixed models, 2021, (In Vorbereitung)

Krivobokova, T., Serra, P., Rosales, F. & Klockmann, K.: Joint non-parametric estimation of mean and auto-covariances for Gaussian processes, 2021, (In Vorbereitung)

Leeb, H., Kivaranovic, D.: A (tight) upper bound for the length of confidence intervals with conditional coverage (Eingereicht)

Leeb, H., Kivaranovic, D., Ristl, R. and Posch, M.: Conformal prediction intervals for the individual treatment effect (In Vorbereitung)

Leeb, H., Steinberger, L.: Conditional predictive inference for high-dimensional stable algorithms (Eingereicht)

Pötscher, B. & Preinerstorfer, D.: Valid Heteroskedasticity Robust Testing, 2021, (Eingereicht)

6 Dissemination of Research

Presentations at Workshops, Conferences and Outside Seminars

	Event/Institution	Title of Presentation
Ilya Archakov	15th International Conference on Computational and Financial Econometrics (CFE-CMStatistics 2021), 19/12/21	A Canonical Representation of Block Matrices
Tatyana Krivobokova	CFE-CMStatistics 2021 - 14th International Conference of the ERCIM WG on Computational and Methodological Statistics, 15th International Conference on Computational and Financial Econometrics, 18/12/21	Factor analysis for data with heterogenous blocks
Johannes Moritz Jirak	CFE-CMStatistics 2021 - 14th International Conference of the ERCIM WG on Computational and Methodological Statistics, 15th International Conference on Computational and Financial Econometrics, 18/12/21	Quantitative limit theorems and bootstrap approximations for empirical projection
Christa Cuchiero	Mathematical Finance Seminar, 03/05/21	Optimal bailout strategies and the drift-controlled supercooled Stefan problem
Georg Keilbar	University of York Econometrics Seminar, 18/11/21	A projection-based for interactive fixed effects panel data models
Hannes Leeb	Duke Statistical Science Seminar, Duke University, 22/10/21 (virtual)	On the length of confidence intervals with conditional coverage

Hannes Leeb	Hausdorff School 'High-Dimensional Statistics', University of Bonn, 26/07/21 → 30/07/21	Model Selection, Regularization and Inference: Why and Why Not?
Hannes Leeb	Forschungsseminar Mathematische Statistik, Humboldt University of Berlin, 19/05/21 (virtual)	On the length of confidence intervals with conditional coverage
Peter Kramlinger	Universität Bayreuth, 15/10/21	Modeling Fluorescence Lifetime Imaging with a Bayesian Hierarchy
Christa Cuchiero	Florence-Paris Workshop on Mathematical Finance, 01/10/21	Signature SDEs as affine and polynomial processes
Karolina Klockmann	German Probability and Statistics Days, 28/09/21	Fully data-driven non-parametric estimation of Toeplitz covariance matrices
Karolina Klockmann	Royal Statistical Society 2021 International Conference, 08/09/21	Fully data-driven non-parametric estimation of Toeplitz covariance matrices
Christa Cuchiero	Next Generation Models of Financial Data, 01/09/21	Signature SDEs as affine and polynomial processes
Christa Cuchiero	6th Berlin Workshop for Young Researchers on Mathematical Finance, 23/08/21 → 25/08/21	From signature methods in finance to affine and polynomial processes and back
Lukas Steinberger	Joint Statistical Meeting 2021: Statistics, Data, and the Stories They Tell, 08/08/21 → 12/08/21	Sequentially interactive versus non-interactive local differential privacy: estimating the quadratic functional
Christa Cuchiero	10th Bernoulli-IMS World Congress, 20/07/21	From signature methods in finance to affine and polynomial pro- cesses and back
Lukas Steinberger	10th Bernoulli-IMS World Congress, 19/07/21 → 23/07/21	Sequentially interactive versus non-interactive local differential privacy: estimating the quadratic functional
Christa Cuchiero	Introduction to decision making and uncertainty- Machine learning and Mean Field Games, 01/07/21	From neural SDEs and signature methods to affine and polyno- mial processes and back
Ilya Archakov	2021 Annual Conference of the International Association for Applied Econometrics (IAAE), 22/06/21 → 25/06/21	A Canonical Representation of Block Matrices

Christa Cuchiero	Summer school on Distributed Control, 16/06/21	Deep calibration via signature based models
Nikolaus Hautsch	13th Annual Meeting of the Society for Financial Econometrics (SoFiE) Conference, 16/06/21	No Title
Ilya Archakov	13th Annual Meeting of the Society for Financial Econometrics (SoFiE) Conference, 15/06/21	A Canonical Representation of Block Matrices
Nikolaus Hautsch	13th Annual Meeting of the Society for Financial Econometrics (SoFiE) Conference, 14/06/21	No Title
Hannes Leeb	Humboldt-Universität zu Berlin, 19/05/21	On the length of confidence intervals with conditional coverage
Christa Cuchiero	Online conference beyond the boundaries: new directions in financial and actuarial mathematics, 01/05/21	Signature based models in finance: relation to affine and polynomial processes, calibration and inclusion of jumps
Sara Papariello-Svaluto-Ferro	Talks in Financial and Insurance Mathematics, Online Zoom, 29/04/21	Universality of affine and polynomial processes
Christa Cuchiero	Talks in Financial and Insurance Mathematics, 21/04/21	Virtual Princeton-Rutgers Financial Math Seminar
Nikolaus Hautsch	Midwest Finance Association, 25/02/21	Annual Meeting of the Midwest Finance Association
Christa Cuchiero	Cumulants in Stochastic Analysis, 25/02/21	Cumulants in Stochastic Analysis
Christa Cuchiero	UCLA- Financial and Actuarial Mathematics Seminar, 23/02/21	UCLA- Financial and Actuarial Mathematics Seminar
Christa Cuchiero	North British Probability seminar, 04/02/21	North British Probability seminar
Christa Cuchiero	Berlin probability Colloquium, 03/02/21	Berlin probability Colloquium
Christa Cuchiero	From signature methods in finance to affine and polynomial processes and back, 22/01/21	From signature methods in finance to affine and polynomial processes and back

Departmental Seminar (ISOR Colloquium)

March 22	Gilles Stupfler	Asymmetric least squares techniques for extreme risk estimation (Webinar)
April 19	Phebe Vayanos	Designing Robust, Interpretable, and Fair Social and Public Health Interventions (Webinar)
May 17	Efstathios Paparoditis	Bootstrapping Whittle Estimators (Webinar)
May 31	Marco Mondelli	Inference in High Dimensions for Generalized Linear Models: the Linear, the Spectral and the Approximate (Webinar)
June 21	Tobias Fissler	Backtesting Systemic Risk Forecasts using Multi-Objective Elicitability (Webinar)
October 18	Thomas Mikosch	The joint limit distribution of partial maxima and partial sums of a heavy-tailed time series
October 25	Herbert Edelsbrunner	Shape, Homology, Persistence, and Stability
November 8	David Preinerstorfer	Consistency of p-norm based tests in high dimensions: characterization, monotonicity, domination
November 10	Peter R. Hansen	New results about Correlation Matrices

7 Grants and Externally Funded Research Projects

Radu Ioan Bot (Principal Investigator) Immanuel Bomze (Co-Investigator), Monika Henzinger (Co-Investigator), Arnold Neumaier (Co-Investigator)	Title: VGSCO: Vienna Graduate School on Computational Optimization (2nd Funding period) Funding: FWF Funding period: 2020-2024
Karl Franz Dörner (Project-Coordinator) Immanuel Bomze (Co-Investigator) Radu Ioan Bot (Co-Investigator) Sylvia Kritzinger (Co-Investigator) Research Associates: Michael Kahr, Michael Sedlmayer, David Wolfinger	Title: Logistics decision support in the pandemic Funding: FWF Funding period: 2020-2022
Christa Cuchiero (Project-Coordinator) Research Associates: Benedict Bauer, Florian Huber, Janka Möller, Francesca Primavera, Stefan Rigger, Sara-Svaluto-Ferro	Title: Universal structures in Mathematical Finance Funding: FWF, 2019 START – Prize Funding period: 2020-2026

Christa Cuchiero (Project-Coordinator), Irene Klein (Co-Investigator), Thorsten Schmidt (Co-Investigator) Research Associates: Guido Gazzani	Title: Dynamic Uncertainty Modeling in Finance Funding: 2018 DFG-FWF-Project Funding period: 2019-2022	
Christa Cuchiero (Project-Coordinator), Walter Schachermayer (Co-Investigator) Research Associates: Stefan Rigger, Sara-Svaluto Ferro	Title: Macroprudential bank regulation: a continuous time approach Funding: WWTF Funding period: 2017-2021	
Nikolaus Hautsch (Principal Investigator) Research Associate: Ilya Archakov	Title: Econometrics of Central Counterpart Risk Management Funding: FWF Funding period: 2020-2023	
Nikolaus Hautsch (Principal Investigator)	Title: Vienna Graduate School of Finance Funding: doc.funds, FWF Funding period: 2018-2022	
Nikolaus Hautsch (Principal Investigator) Research Associate: Ilya Archakov	Title: Order Book Foundations of Price Risks and Liquidity: An Integrated Equity and Derivatives Markets Perspective Funding: FWF Funding period: 2017-2022	
Nikolaus Hautsch (Principal Investigator) Research Associate: Yuan Chen	Title: Econometrics of Systemic Risk: Inference, Model Comparison and Network Dependencies Funding: Jubiläumsfonds OeNB Funding Period: 2021-2025	
Erhard Reschenhofer (Principal Investigator) Research Associate: Thomas Stark	Title: Stock return and volatility forecasting with order book data Funding: OeNB Funding period: 2019-2021	

8   Research Stays at Other Institutions

	Institution	Weeks
Christa Cuchiero	Akademiezentrum Raitenhaslach TUM, Germany, Research topic: Next Generation Models of Financial Data	20.09.2021 - 22.09.2021
Christa Cuchiero	ETH Zürich, Switzerland, Research topic: Universality properties of affine processes, (randomized) signature methods	23.09.2021 - 24.09.2021
Christa Cuchiero	ETH Zürich, Switzerland, Research topic: Signature SDEs as affine and polynomial processes	02.11.2021 - 02.11.2021

Christa Cuchiero	University of Verona, Italy, Research topic: Measure-valued affine and polynomial processes, neural SPDEs for termstructure modeling	24.11.2021-26.11.2021
Christa Cuchiero	ETH Zürich, Switzerland, Research topic: Signature SDEs as affine and polynomial processes, Optimial bailout strategies in the supercooled Stefan problem	07.12.2021 - 10.12.2021

9 Other Faculty Activities

Editorial Work

Immanuel Bomze	Associate Editor
	▪ Central European Journal of Operations Research
	▪ European Journal of Operational Research
	▪ Journal of Global Optimization
	▪ Operations Research Perspectives
	▪ Optimization Letters
	Editor-in-Chief
	▪ EURO Journal on Computational Optimization
	Member of Editorial Board
	▪ Central European Journal of Operations Research
	▪ European Journal of Operational Research
	▪ Journal of Global Optimization
	▪ Operations Research Perspectives
	▪ Optimization Letters
Christa Cuchiero	Associate Editor
	▪ Finance and Stochastics
	▪ Frontiers of Mathematical Finance
	▪ Mathematical Finance
	▪ Stochastics
	▪ The Journal of Computational Finance
Walter J. Gutjahr	Associate Editor
	▪ Central European Journal of Operations Research
	Department Editor
	▪ OR Spectrum
	Member of Editorial Board
	▪ EURO Journal on Decision Processes
	Member of Editorial Review Board
	▪ Production and Operations Management

Nikolaus Hautsch	Associate Editor
	▪ Journal of Applied Econometrics
	▪ Journal of Business and Economic Statistics
	▪ International Journal of Forecasting
	▪ Market Microstructure and Liquidity
	▪ Journal of Financial Econometrics
	Editorial Board
	▪ Econometrics
	Managing Editor
	▪ Quantitative Finance
Johannes Moritz Jirak	Associate Editor
	▪ Statistical Inference for Stochastic Processes
Tatyana Krivobokova	Associate Editor
	▪ Journal of the American Statistical Association
	▪ Scandinavian Journal of Statistics
Hannes Leeb	Co-Editor
	▪ Special issue of Econometric Theory
Benedikt M. Pötscher	Associate Editor
	▪ Journal of Statistical Planning and Inference
	Co-Editor
	▪ Econometric Theory
Lukas Steinberger	Associate Editor
	▪ Statistical Papers

Refereeing

Immanuel Bomze	▪ European Journal of Operational Research
	▪ Optimization Letters
	▪ SIAM Journal on Optimization
	▪ The ANZIAM journal: the Australian & New Zealand Industrial and Applied mathematics Journal
Christa Cuchiero	▪ Annals of Applied Probability
	▪ Finance and Stochastics
	▪ Mathematical Finance: An International Journal of Mathematics
	▪ SIAM Journal on Financial Mathematics
	▪ Sigma
	▪ Statistics and Financial Economics
	▪ Stochastic Processes and their Applications
Gianluca Finocchio	▪ Bernoulli: a journal of mathematical statistics and probability (1)

Walter J. Gutjahr	- CEJOR (3) - European Journal of Operational Research (2) - IISE Transactions (1) - International Journal of Disaster Risk Reduction (2) - International Journal of Production Economics (1) - Journal of Humanitarian Logistics and Supply Chain Management (1) - Operations Research (1) - Socio-Economic Planning Sciences (2)
Nikolaus Hautsch	- Deutsche Forschungsgemeinschaft (1) - Journal of Applied Econometrics (5) - Journal of Banking and Finance (1) - Journal of Econometrics (1) - Journal of Finance (1) - Journal of Financial Econometrics (1) - Management Science (1) - OeNB Jubiläumsfonds (2)
Florian Huber	- Stochastic Processes and their Applications
Johannes Moritz Jirak	- Annals of Statistics - Bernoulli: a journal of mathematical statistics and probability - Scandinavian Journal of Statistics - SIAM/ASA Journal on Uncertainty Quantification
Georg Keilbar	- Computational Statistics (1) - Journal of Labour Market Research (1)
Irene Klein	- Finance and Stochastics (2)
Tatyana Krivobokova	- Annals of Statistics (2) - Biometrika (3) - Computational Statistics (1) - Econometrics and Statistics (1)
Hannes Leeb	- Annals of Statistics - Biometrika - Journal of the American Statistical Association
Benedikt M. Pötscher	- Econometric Theory (multiple)
Stefan Rigger	- Annals of Applied Probability (2) - Finance and Stochastics (1)
Werner Schachinger	- Computers and Operations Research - Journal of Combinatorial Theory, Series A
Lukas Steinberger	- Bernoulli: a journal of mathematical statistics and probability - Electronic Journal of Statistics - Journal of Statistical Planning and Inference

Other Professional Activities

Immanuel Bomze	▪ Board Member of Research Network Data Science, Univ. Vienna, Austria ▪ Board Member of Research Platform Governance of digital practices, Univ. Vienna, Austria ▪ Director of Studies PhD Programme, Univ. Vienna, Austria (since Oct 2020) ▪ Member of EURO Executive Committee (as EURO Past President)
Christa Cuchiero	▪ Board Member of Research Network Data Science, Univ. Vienna, Austria ▪ Co-Organizer of World Online Seminars on Machine Learning in Finance, online ▪ Co-Organizer of the Vienna Seminar in Mathematical Finance and Probability, Vienna, Austria ▪ Member of the Scientific Committee of the 15th International Conference on Computational and Financial Econometrics (CFE 2021) and Organizer of an invited session, London, UK, Dec 2021 ▪ PhD reviewer of Marc Chataigner (Université Paris Saclay, France) ▪ PhD reviewer of Houzhi Li ((Université de Paris, France) ▪ PhD reviewer of Sophian Mehalla (Université Paris-Est Sup, France) ▪ PhD reviewer of Enzo Miller (Université de Paris, France) ▪ PhD reviewer of Giacomo Toscano (Scuola Normale Pisa, Italy) ▪ PhD reviewer of Xi Kleisinger-Yu (ETH Zurich, Switzerland)
Nikolaus Hautsch	▪ Board Member of Research Network Data Science, Univ. Vienna, Austria ▪ Deputy Head of Department (since Oct 2020)
Hannes Leeb	▪ Board Member of Research Network Data Science, Univ. Vienna, Austria ▪ Vice Dean Research of Faculty of Business, Economics and Statistics, Univ. Vienna, Austria (since Oct 2020)
Benedikt M. Pötscher	▪ Head of Department (since Oct 2020) ▪ Co-Organizer of "5th Vienna Workshop on High-dimensional Time Series in Macroeconomics and Finance - A tribute to Manfred Deistler"
Werner Schachinger	▪ Deputy Director of Studies Programme Statistics, Univ. Vienna, Austria (since Oct 2020)
Lukas Steinberger	▪ Head of Admission Board for Master Studies in Data Science, Univ. Vienna, Austria ▪ Member of the European Regional Council of the Bernoulli Society