Institut für Statistik und Operations Research
Department of Statistics and Operations Research

universität wien

ANNUAL REPORT 2015

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Content

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 2015. 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. During the academic year 2014/15 the department taught also many undergraduate and graduate courses for programs run by other departments, including the Department of Business Administration and the Department of Economics.

In 2015, our department has been strengthened by the arrival of Corina Birghila, Georg Brandstätter, Daniela Escobar, Martin Glanzer, Sandor Guzmics and Mario Ruthmair as assistants, Julia Brandstätter as administrative assistant and Yousef Ello as system administrator.

David Preinerstorfer, Lukas Steinberger and Markus Sinnl successfully defended their theses and graduated from the PhD Programme in Statistics and Operations Research.

There were also several departures. The following people left the department to pursue excellent new professional opportunities: Ivana Ljubic started as Professor of OR at ESSEC Business School of Paris, François Bachoc started as Associate Professor at Toulouse Mathematics Institute and University Paul Sabatier and Christine Wallisch changed to Meduni Wien. The department regrets their departures but congratulates them to their successful new career steps. We wish them well in their new positions.

I would like to express special thanks to Dominique Sundt for editing the Annual Report 2015.

Irene Klein
(Head of Department)

Vienna, October 2017

2 Faculty and Staff

Regular Faculty

François Bachoc (PhD)	Gaussian Process Modeling, Covariance Function Estimation, Metamodeling and Validation of Computer Models, Small-Probability Estimation, Model Selection
Corina Birghila (MSc)	Extreme Value Theory, Insurance Pricing
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
Gökhan Cebiroglu (Dr.)	Financial Econometrics, Market Microstructure, Structural Modelling, Mechanism and Market Design, Financial Markets, Quantitative Finance, Game Theory, Asset Pricing, Efficient Programming, Optimization, Genetic Algorithms, High-Frequency Trading
Marek Chudy (Mgr.)	Macroeconomic Forecasting, Financial Econometrics, Model Selection Methods
Daniela Escobar (MSc)	Linear and Non-Linear Time Series Analysis, Risk Management, Application in Energy Markets
Martin Glanzer (Dipl.-Ing.)	Stochastic optimization and Quantitative Finance
Walter Gutjahr (Prof.)	Optimization Theory, Discrete Optimization, Stochastic Modeling, Multicriteria Decision Analysis
Sandor Guzmics (MSc)	Stochastic Optimization, Financial Mathematics, Systemic Risk in Financial Systems
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
Irene Klein (Assoc. Prof.)	Stochastic Finance
Hannes Leeb (Prof.)	Model Selection, Regularization, and Shrinkage, Statistical Analysis of High-Dimensional Data, Spectral Analysis of Large Random Matrices
Martin Luipersbeck (Dipl.-Ing.)	(Mixed) Integer Programming, Network Design, Algorithm Engineering
Ivana Ljubic (Ass. Prof.)	Algorithmic Operations Research, Algorithm Engineering

Ivana Milovic (MAS)	Model Selection in High-Dimensional Linear Models
Georg Pflug (Prof.)	Mathematical Statistics, Stochastic Optimization, Risk Management
Benedikt Pötscher (Prof.)	Econometrics, Statistics, Time Series Analysis
David Preinerstorfer (Dr.)	Mathematical Statistics, Econometrics, Time Series Analysis, Psychometrics
Erhard Reschenhofer (Assoc. Prof.)	Time Series Analysis, Financial Econometrics, Automatic Model Selection, Chronobiology
Alexander Ristig (Dr.)	Financial econometrics and statistics, Copula and quantile-based dependence concepts, Iterative estimation techniques, Applications in finance, risk management and economics.
Werner Schachinger (Assoc. Prof.)	Optimization, Probabilistic Analysis of Algorithms
Nina Senitschnigg (Dr.)	Mathematical Statistics, Predictive Inference, Shrinkage Estimation in High Dimensions, Nonparametric Regression
Lukas Steinberger (Dr.)	Mathematical Statistics, Statistical Analysis of High-Dimensional Data
Reinhard Ullrich (MMag.)	Evolutionary Game Theory and Dynamical Systems
Christopher Walsh (Dr.)	Non- and Semiparametric Statistics and Econometrics, Financial Econometrics, Time Series, High Dimensional Statistics

Externally Funded Faculty

Georg Brandstätter (Dipl.-Ing.)	Combinatorial Optimization, Integer Linear Programming, Transportation and Logistics Optimization
Markus Leitner (Dr.)	Operations Research, Combinatorial Optimization, (Mixed) Integer Linear Programming, Multi-objective Optimization
Mathias Pohl (MSc)	Dependence modeling and Copulas, High Frequency Trading, Model Ambiguity, Optimal Transport, Portfolio Optimization, Robust Optimization
Mario Ruthmair (Dr.)	

Markus Sinnl (PhD)	Theoretical and Computational Aspects of Mixed Integer (Non-)Linear Programming, Decomposition Methods for Mixed Integer (Non-)Linear Programming, Bilevel Programming, Combinatorial Optimization, Bi-and Multi-Objective Optimization, Robust and Stochastic Optimization Matheuristics, Areas of Application: Network Design, Telecommunications, Systems Biology
Christine Wallisch (MSc)	Risk Management

External Lecturers (Academic Year 2014/15)

Andreas Baierl, Marek Chudy, Manfred Deistler (TU Vienna), Sarah Dippenaar, Evelina Erlacher, Florian Frommlet (MedUni Vienna), Miguel Gallach, Angelika Geroldinger, Wilfried Grossmann, Georg Heinze (MedUni Wien), Marcus Hudec, Johannes Klotz, Simon Konzett, Raimund Kovacevic (TU Vienna), Eric Laas-Nesbitt, Abdel Lisser (Université Paris Sud), Dominic Magirr (MedUni Vienna), Nysret Musliu (TU Vienna), Herbert Nagel (WU Vienna), Daniel Obszelka, Stefan Rath, Peter Reiter, Robin Ristl, Nikolaos Sahinidis (Carnegie Mellon University), Harald Schwab, Markus Sinnl, Alexander Tichy (VetMedUni Vienna), Gabriele Uchida, Claus Vogl (VetMedUni Vienna).

Teaching Assistants (Academic Year 2014/15)

Alena Bachleitner, Dominik Hauschek, Florentin Kerschbaumer, Bernhard Kober, Alexander Ruth, Karina Traub, Christine Wallisch

Administrative Assistants

Birgit Ewald, Julia Brandstätter, Gerald Kamhuber (on leave), Vera Lehmwald, Manuela Nicham-Zorn, Dominique Sundt

System Administrators

Jürgen Berlakovich, Yousef Ello, Stefan Geissler, Rolf Karner, Andreas Loibl, Svetlana Mihajlovic

3 Visitors

Elena Fernandez (Universitat Politecnica de Catalunya, Spain), Yuri Goegebeur (Syddansk Universitet, Denmark), Wolfgang Härdle (Humboldt Universität Berlin, Germany), Francesca Maggioni (Università di Bergamo, Italy), Per Mykland (University of Chicago, USA)

4 Teaching

Theses Supervised

PhD Theses in Progress

Supervisor	Author	Title
Immanuel Bomze, Werner Schachinger*	Reinhard Ullrich	Selecting equilibria from an ample choice
Hannes Leeb	Ivana Milovic	Conditional means of low-dimensional projections from high-dimensional data
Ivana Ljubic, Markus Leitner*	Georg Brandstätter	Solving optimization problems arising in the context of electric car sharing systems
Ivana Ljubic, Markus Leitner*	Martin Luipersbeck	Large-scale Network Optimization: Applications in Bioinformatics
Georg Pflug, Walter Schachermayer	Mathias Pohl	Robust portfolio optimization with copulas
Georg Pflug	Corina Birghila	Insurance premium under ambiguity
Georg Pflug	Daniela Escobar	Analysis of Risk Premia in Energy Markets
Georg Pflug	Martin Glanzer	Pricing of Contingent Claims under Model Ambiguity
Georg Pflug	Sandor Guzmics	Systemic Risk in Financial Systems
Georg Pflug	Eric Laas-Nesbitt	Trust-Region Methods for Endogenous Stochastic Optimization
Erhard Reschenhofer	Marek Chudy	Analysis and Predication of Economic Time Series

PhD Theses Finished

Supervisor	Author	Title
Walter Gutjahr*	Fliedner, Thomas (TU Munich)	Considering uncertainty in project management and scheduling
Walter Gutjahr*	Alexander Schnell	An application of constraint programming and Boolean satisfiability solving techniques to variants of the resource-constrained project scheduling problem

* Reviewer = Second Supervisor

Georg Pflug*	Sebastian Krinninger (Faculty of Computer Science)	Faster approximation algorithms for partially dynamic shortest path problems
Hannes Leeb	Lukas Steinberger	Statistical inference in high-dimensional linear regression based on simple working models
Ivana Ljubic, Immanuel Bomze*	Markus Sinnl	Bi-objective optimization for telecommunication networks
Benedikt M. Pötscher	David Preinerstorfer	Autcorrelation robust testing in time series regression models
Erhard Reschenhofer*	Hannes Leu	Die Aktivierung von Verlustvorträgen als Instrument zur Ergebnissteuerung von Industrieunternehmen

Master Theses in Progress

Supervisor	Author	Title
Nikolaus Hautsch	André Thea	Forecasting Realised VolatilityUsing Jumps at Ultra-High Frequency
Nikolaus Hautsch	Johannes Florian	Optimal Order Placement in Limit Order Book Markets
Nikolaus Hautsch	Stefan Müller	Volatility Knockout Options
Irene Klein	Marko Kuncic	Pricing of barrier options
Georg Pflug	Theodoros Kouimtsidis	Systemic risk for the Austrian banking system
Georg Pflug	Christian Zwatz	Copula-GARCH-Modelle angewendet auf CDS-Spreads einer Auswahl internationaler Banken

Master Theses Finished

Supervisor	Author	Title
Walter Gutjahr	Sebastiana Mariut	Optimization of resource allocation during pandemics
Erhard Reschenhofer	Lisa Maria Inreiter	Identification and Estimation of Structural Breaks in Time Series

Bachelor Theses

Immanuel Bomze (4), Erhard Reschenhofer (1)

5 Publications

Journal Articles

Bomze, **Immanuel;** Overton, Michael: Narrowing the difficulty gap for the Celis-Dennis-Tapia problem. *Mathematical Programming 151* (2), 20-37. 2015

Amaral, Paul Alexandra; **Bomze**, **Immanuel**: Copositivity-based approximations for mixed-integer fractional quadratic optimization. *Pacific Journal of Optimization* 11 (2), 225-238. 2015

Bomze, **Immanuel**; Dickinson, Peter J. C.; Still, G.:The structure of completely positive matrices according to their CP-rank and CP-plus-rank. *Linear Algebra and its Applications* 482, 191-206. 2015

Bomze, **Immanuel**: Copositive relaxation beats Lagrangian dual bounds in quadratically and linearly constrained QPs. *SIAM Journal on Optimization* 25 (3), 1249–1275. 2015

Bomze, Immanuel; Schachinger, Werner; Ullrich,Reinhard: New lower bounds and asymptotics for the cp-rank. *SIAM Journal on Matrix Analysis and Applications 36*, no. 1, 20-37. 2015

Shaked-Monderer, Naomi; Berman, Abraham; **Bomze, Immanuel**; Jarre, Florian; **Schachinger, Werner**: New results on the cp rank and related properties of co(mpletely)positive matrices. *Linear and Multilinear Algebra 63*, 384-396. 2015

Brandstätter, Georg; Gambella, Claudio; Leitner, Markus; Malaguti, Enrico; Masini, Filippo; Puchinger, Jakob; Ruthmair, Mario; Vigo, Daniele: Overview of Optimization Problems in Electric Car-Sharing System Design and Management. *Dynamic Perspectives on Managerial Decision Making (accepted)*

Gutjahr, Walter J.: Bi-objective multi-mode project scheduling under risk aversion. *European Journal of Operational Research 246*, 421–434. 2015

Härdle, Wolfgang K.; **Hautsch, Nikolaus**; Mihoci, Andrija: Local Adaptive Multiplicative Error Models for High-Frequency Forecasts. *Journal of Applied Econometrics, 30 (4)*, 529-550. 2015

Hautsch, Nikolaus; Schaumburg, Julia; Schienle, Melanie: Financial Network Systemic Risk Contributions. *Review of Finance, 19 (2),* 685-738. 2015

Hautsch, Nikolaus; Kyj, Lada M.; Malec, Peter: Do High-Frequency Data Improve High-Dimensional Portfolio Allocation? *Journal of Applied Econometrics 30 (2),* 263-290. 2015

Cordero, Fernando; **Klein, Irene**; Perez-Ostafe, Lavinia: Asymptotic proportion of arbitrage points in fractional binary markets. *Stochastic Processes and their Applications 126/2*, 315-336. 2016

Leeb, Hannes: Discussion: An adaptive resampling test for detecting the presence of significant predictiors. *Journal of the American Statistical Association: 110*, 1457-1459. 2015

Gouveia, Luis**; Leitner, Markus; Ljubic, Ivana**: The two-level diameter constrained spanning tree problem. *Mathematical Programming, 150(1)*, 49-78. 2015

Leitner, Markus; Ljubic, Ivana; Sinnl, Markus: A computational study of exact approaches for the bi-objective prize-collecting Steiner tree problem. *INFORMS Journal on Computing 27*, 118-134. 2015

Alvarez-Miranda, Eduardo; **Ljubic, Ivana**; Fernández, Elena: The Recoverable Robust Facility Location Problem. *Transportation Research Part B: Methodological 79. 2015*

Pflug, Georg; Boreiko, Dmitri; Kaniovskyi, Yuri: Modeling Dependent Credit Rating Transitions: A Comparison of Coupling Schemes and Empirical Evidence. *Central European Journal of Operations Research 23. 2015*

Pflug, Georg; Pichler, Alois: Dynamic Generation of Scenario Trees. *Computational Optimization and Applications 62* (3), 641-668. 2015

Heidergott, Bernd; Haralambie, Leahu; Löpker, Andreas; **Pflug, Georg**: Perturbation Analysis of finite Markov Chains. *Advances of Applied Probability (forthcoming)*

Pflug, Georg; Pichler, Alois: Time-inconsistent multistage stochastic programs: martingale bounds. *European Journal of Operational Research 249 (1),* 155-163. 2015

Timonina, Anna; **Pflug, Georg;** Hochrainer-Stigler, Stefan; Jongmann, Brenden; Rojas, Rodrigo: Structured Coupling of Probability Loss Distributions: Assessing Joint Flood Risk in Multiple River Basins. *Risk Analysis 25 (11),* 2012-2119. 2015

Pötscher, Benedikt M.; Preinerstorfer, David: On Size and Power of Heteroscedasticity and Autocorrelation Robust Tests. *Econometric Theory (forthcoming)*

Pötscher, Benedikt M.; Preinerstorfer, David: On the Power of Invariant Tests for Hypotheses on a Covariance Matrix. *Econometric Theory (forthcoming)*

Pötscher, Benedikt M.; Leeb, Hannes; Ewald, Karl: On Various Confidence Intervals Post-Model-Selection. *Statistical Science 30*, 216-227. 2015

Reschenhofer, Erhard; Chudy, Marek: Adjusting band-regression estimators for prediction: shrinkage and downweighting. *International Journal of Econometrics and Financial Management* 3 (3), 121-130. 2015

Reschenhofer, Erhard; Chudy, Marek: Imposing frequency-domain restrictions on time-domain forecasts. *Journal of Statistical and Econometric Methods* 4 (3), 1-16. 2015

Reschenhofer, Erhard: Criteria for pairwise variable selection. *SOP Transactions on Statistics and Analysis 2*, 2015.

Reschenhofer, Erhard: Consistent variable selection in large regression models. *Journal of Statistics: Advances in Theory and Applications 14 (1)*, 49-67, 2015.

Contributions to Proceedings and Edited Books

Gutjahr, Walter J: Project portfolio selection under skill development. Handbook on Project Management and Scheduling Vol. 2 (Eds.: Christoph Schwindt and Juergen Zimmermann), Springer International Publishing, 729–750. 2015

Branke, Juergen; Corrente, Salvatore; Greco, Salvatore; **Gutjahr, Walter J.:** Using indifference information in robust ordinal regression. Lecture Notes in Computer Science 9019 (Evolutionary Multi-Criterion Optimization), 205–217. 2015

Kovacevic, Raimund; **Pflug, Georg**: Measuring Systemic Risk. Structural Approaches. *Chapter 1, 3-21* In: Zopounidis, & Galariotis (Eds.): *Quantitative Financial Risk Management: Theory and Practice.* John Wiley & Sons, Ltd. 2015.

Working Papers

Bomze, **Immanuel**: Copositivity for second-order optimality conditions in general smooth optimization problems. *To appear in: Optimization*. 2015

Brandstätter, Georg; Gambella, Claudio; **Leitner, Markus;** Malaguti, Enrico; Masini, Filippo; Puchinger, Jakob; **Ruthmair, Mario;** Vigo, Daniele: Overview of Optimization Problems in Electric Car-Sharing System Design and Management. *Dynamic Perspectives on Managerial Decision Making (accepted)*

Chudy, Marek; Reschenhofer, Erhard: Macroeconomic Forecastig with Many Predictors. *(working paper)*

Gutjahr, **Walter J**.; Dzubur, Nada: Bi-objective bilevel optimization of distribution center locations considering user equilibria. *To appear in: Transportation Research Part E 85*, 1-22. 2016

Gutjahr, **Walter J.;** Nolz, Pamela C.: Multicriteria optimization in humanitarian aid. *(accepted)*

Burkart, Christian; Nolz, Pamela C.; **Gutjahr, Walter J.:** Modelling beneficiaries' choice in disaster relief logistics. *(accepted)*

Hautsch, Nikolaus; Herrera, Rodrig: Multivariate dynamic intensity peaks-over-threshold models. *CFS Working Paper Series 516*, Center for Financial Studies (CFS). 2015

Cuchiero, Christa; **Klein, Irene**; Teichmann, Josef: A new perspective on the fundamental theorem of asset pricing for large financial markets. *To appear in: Theory of Probability and its applications.*

Cordero, Fernando; **Klein, Irene**; Perez-Ostafe, Lavinia: Asymptotic Arbitrage in fractional mixed markets. (*Preprint)*

Leeb, Hannes; Kabaila, Paul: Admissibility of the usual confidence set for the mean of a univariate or bivariate normal population: The unknown variance case. *(submitted)*

Leitner, Markus: Layered Graph Models and Exact Algorithms for the Generalized Hop-Constrained Minimum Spanning Tree Problem. *To appear in: Computers & Operations Research 65*, 1-18. 2016.

Leitner, Markus: Integer Programming Models and Branch-and-Cut Approaches to Generalized {0,1,2}-Survivable Network Design Problems. *(submitted)*

Gouveia, Luis; **Leitner, Markus:** Design of Survivable Networks with Vulnerability Constraints (s*ubmitted)*

Fischetti, Matteo; **Leitner, Markus; Ljubic, Ivana; Luipersbeck, Martin**; Monaci, Michele; Resch, Max; Salvagnin, Domenico; **Sinnl, Markus**: Thinning out Steiner trees: A node-based model for uniform edge costs. *(submitted)*

Leitner, Markus; **Ljubic, Ivana**; Riedler, Martin; **Ruthmair, Mario**: Exact Approaches for Network Design Problems with Relays. *(submitted)*

Leitner, Markus; Ljubic, Ivana; Sinnl, Markus; Werner, Axel: A new exact method and matheuristics for bi-objective 0/1 ILPs: Application to FTTx-network design. *(submitted)*

Leitner, Markus, Ljubic, Ivana; Salazar-Gonzalez, Juan-Jose; **Sinnl, Markus**: The Connected Facility Location Polytope. *(submitted)*

Gouveia, Luis; **Leitner, Markus**; **Ljubic, Ivana**: A polyhedral study of the diameter constrained minimum spanning tree problem. *(submitted)*

Fischetti, Matteo; **Ljubic, Ivana**; **Sinnl, Markus:** Benders Decomposition without Separability: a computational study for capacitated facility location problems. *(submitted)*

Fischetti, Matteo; **Ljubic, Ivana**; **Sinnl, Markus:** Redesigning Benders Decomposition for Large-Scale Facility Location Problems *(to appear in Management Science)*

Fischetti, Matteo; **Ljubic, Ivana;** Monaci, Michele; **Sinnl, Markus:** Intersection Cuts for Bilevel Optimization. *(to appear in Proceedings of IPCO XVIII)*

Alvarez-Miranda, Eduardo**; Ljubic, Ivana; Luipersbeck, Martin; Sinnl, Markus**: Solving minimum-cost shared arborescence problems. *(submitted)*

Alvarez-Miranda, Eduardo; Farhan, Hesso; **Luipersbeck, Martin; Sinnl, Markus**: A bi-objective network design approachfor discovering functional modules linking Golgi apparatus, fragmentation and neuronal death. *(submitted)*

Alvarez-Miranda, Eduardo; **Luipersbeck, Martin; Sinnl, Markus**: Optimal upgrading schemes for effective shortest paths in networks. *To appear in: Proceedings of the CPAIOR.*

Pötscher, Benedikt M.; Leeb, Hannes; Bachoc, Francois: Valid Confidence Intervals for Post-Model-Selection Predictors. *(submitted)*

Kang, Liujiang Zhu, ; Xiaoning; Wu, Jianjun; Puchinger, Jakob; **Ruthmair, Mario**; Hu, Bin: Modeling and solving the first train timetabling problem with minimal missed trains in subway networks. (*submitted)*

Asamer, Johannes; Graser, Anita; Heilmann, Bernhard; **Ruthmair, Mario:** Sensitivity Analysis for Energy Demand Estimation of Electric Vehicles. *(submitted)*

Asamer, Johannes; Reinthaler, Martin; **Ruthmair, Mario**; Straub, Markus; Puchinger, Jakob: Optimizing Charging Station Locations for Urban Taxi Providers. *(submitted)*

Sinnl, Markus; Ljubic, Ivana: A Node-Based Layered Graph Approach for the Steiner Tree Problem with Revenues, Budget and Hop-Constraints. *(submitted)*

Steinberger, Lukas: The relative effects of dimensionality and multiplicity of hypotheses on the F-test in linear regression. *(submitted, available online since Nov. 2015 on arXiv)*

Steinberger, Lukas; Leeb, Hannes: On conditional moments of high-dimensional random vectors given lower-dimensional projections. (s*ubmitted)*

Steinberger, Lukas; Leeb, Hannes: Statistical inference when fitting simple models to high-dimensional data. *(In preparation)*

6 Dissemination of Research

Workshops and Conferences

	Conference	**Title of Presentation**
Immanuel Bomze	MINLP (Mixed Integer Nonlinear Programming) Workshop 2015, Sevilla, Spain (invited)	A fresh CP look at MINLP: new formulations, relaxations and penalizations for QPs, fractional QPs, and quadrically constrained-QPs
Immanuel Bomze	Olomoucian Days of Applied Mathematics (ODAM) 2015 Conference, Olomouc, Czech Republic	Ternary and other hard decision problems: how copositive optimization can help
Immanuel Bomze	Conference Paths, Pivots, and Practice: The Power of Optimization, Montréal, Quebec, Canada (invited)	Conic optimization goes classic in many ways
Immanuel Bomze	13th EUROPT Workshop on Advances in Continuous Optimization, Edinburgh, UK	New bounds for the cp-rank in copositive optimization

Immanuel Bomze	Conference PGMO Days 2015 (Gaspard Monge Program for Optimization and Operations Research), Paris, France	New formulations, relaxations and penalisations for mixed binary Qps
Georg Brandstätter	OR 2015 – International Conference on Operations Research, Vienna, Austria	Time-expanded ILP formulations for finding optimal locations for charging stations in an electric car sharing network
Marek Chudy	European Meeting of Statisticians, Amsterdam, the Netherlands	Imposing Frequency-domain Restrictions on Time Domain Forecasts
Marek Chudy	Joint Statistical Meeting, Seattle, USA	Imposing Frequency-domain Restrictions on Time Domain Forecasts
Walter Gutjahr	Recent Advances in Multiobjective Optimization 2015, Nantes, France	Bi-objective bilevel optimization of facility locations considering user equilibria
Nikolaus Hautsch	Workshop: The Mathematics and Statistics of Quantitative Risk Management, Mathematisches Forschungsinstitut Oberwolfach, Germany (invited)	Estimating the Spot Covariation of Asset Prices – Statistical Theory and Empirical Evidence
Nikolaus Hautsch	2nd International Workshop in Financial Econometrics, Salvador, Brazil (invited)	Efficient Iterative Maximum Likelihood Estimation
Nikolaus Hautsch	Econometrics of High-Dimensional Risk Networks, Stevanovich Center, University of Chicago, USA (invited)	Efficient Iterative Maximum Likelihood Estimation
Nikolaus Hautsch	3rd Symposium on Financial Engineering and ERM, Hitotsubashi University, Tokyo, Japan (invited)	High Speed on Financial Markets – Blessing or Curse?
Hannes Leeb	Workshop on Statistical Inference for Large Scale Data, Vancouver, Canada (invited)	On conditional moments of high-dimensional random vectors given lower-dimensional projections
Hannes Leeb	30th European Meeting of Statisticians, Amsterdam. The Netherlands (invited)	On conditional moments of high-dimensional random vectors given lower-dimensional projections or Model selection when n < d

Markus Leitner	7th International Network Optimization Conference, Warsaw, Poland	Branch-Price-and-Cut for Undirected Multicommodity Fixed-Charge Network Design
Markus Leitner	Joint International Meeting Canadian Operational Research Society Institute for Operations Research and the Management Sciences, Montreal, Canada	Integer Programming Formulations for Survivable Hop Constrained Network Design
Markus Leitner	EURO 2015: 27th European Conference on Operational Research, Glasgow, Scotland	Design of Survivable Networks with Length Constraints
Markus Leitner	OR 2015 – International Conference on Operations Research, Vienna, Austria	Integer Programming Formulations for Survivable Hop Constrained Network Design
Martin Luipersbeck	OR 2015 – International Conference on Operations Research, Vienna, Austria	Optimal design of shared networks: from bioinformatics to telecommunications
Martin Luipersbeck	INOC 2015 - 7th International network optimization conference, Warsaw, Poland	A new model for uniform Steiner trees and related problems
Georg Pflug	Workshop on Risk Management in Very High Dimensions, Vienna, Austria	Huge dimensional Copula models
Georg Pflug	EURO 2015: 27th European Conference on Operational Research, Glasgow, Scotland	Nonparametric Ambiguity: Optimal design of Insurance
Georg Pflug	Computational Management Science 2015, Prague, Czech Republic (invited)	Stochastic Optimization: How to overcome the curse of dimensionality?
Georg Pflug	7th Rutgers Workshop on Optimization of Stochastic Systems, Rutgers University, USA (invited)	Time consistent and information monotone risk functionals
Georg Pflug	EURO Winterschool Kvitfjell, Norway (invited)	Risk based pricing of Energy contracts: the comparison principle
Georg Pflug	Stochastic Models and Control Workshop, Kaiserslautern, Germany (invited)	Huge dimensional Copula models: Estimation of a Europe-wide loss distribution for flood losses

Georg Pflug	SMSA Workshop, Wroclaw, Poland (invited)	On the construction of scenario trees based on the multistage empirical process
Benedikt M. Pötscher	Non-linear models with Non-stationary regressors, Nuffield College, Oxford University, UK (invited)	On Size and Power of Autocorrelation Robust Tests
Markus Sinnl	ISMP 2015 - 22nd International Symposium on Mathematical Programming, Pittsburgh, USA	A new exact method and matheuristics for bi-objective 0/1 ILPs: Application to FTTx-network design
Markus Sinnl	Recent Advances in Multiobjective Optimization, University of Nantes, France	A new exact method and matheuristics for bi-objective 0/1 ILPs: Application to FTTx-network design
Markus Sinnl	Mixed Integer Programming Workshop (MIP) 2015, Chicago, USA	Thinning out Steiner trees (poster presentation)
Markus Sinnl	INOC 2015 - 7th International network optimization conference, Warsaw, Poland	Solving the node-quadratic prize-collecting Steiner tree problem to optimality
Markus Sinnl	OR 2015 – International Conference on Operations Research, Vienna, Austria	Designing Nature Reserves with Connectivity and Buffer Requirements
Lukas Steinberger	European Meeting of Statisticians, Amsterdam, the Netherlands	Statistical inference when fitting simple models to high dimensional data
Lukas Steinberger	Joint Statistical Meetings, Seattle, USA	Statistical inference when fitting simple models to high dimensional data

Outside Seminars

	Institution	**Title of Presentation**
Nikolaus Hautsch	University of Regensburg, Germany	High-Speed on Financial Markets – Blessing or Curse?
Nikolaus Hautsch	CREST, Paris, France	Estimating the Spot Covariation of Asset Prices – Statistical Theory and Empirical Evidence

Nikolaus Hautsch	Tinbergen Institute, Amsterdam, the Netherlands	Estimating the Spot Covariation of Asset Prices – Statistical Theory and Empirical Evidence
Nikolaus Hautsch	Oesterreichische Nationalbank, Vienna, Austria	Systemic Risk Spillovers in the European Banking and Sovereign Network
Nikolaus Hautsch	Vienna Graduate School of Finance, Vienna University of Economics and Business, Austria	The Hidden Side of the Market: Order Exposure and Liquidity Coordination
Nikolaus Hautsch	Lancaster Business School, UK	Estimating the Spot Covariation of Asset Prices – Statistical Theory and Empirical Evidence
Irene Klein	ETH Zurich, Switzerland	New perspectives on the fundamental theorem of asset pricing for large financial markets
Hannes Leeb	University of Mannheim, Germany	On conditional moments of high-dimensional random vectors given lower-dimensional projections
Hannes Leeb	TU Dortmund, Germany	On conditional moments of high-dimensional random vectors given lower-dimensional projections
Markus Leitner	University of Lisbon, Portugal	On Optimal Design of Charging Stations for Electric Vehicles
Benedikt M. Pötscher	Department of Mathematics and Statistics, University of Cyprus (invited)	Model-Selection and Inference: Part I
Benedikt M. Pötscher	Department of Mathematics and Statistics, University of Cyprus (invited)	Model-Selection and Inference: Part II
Benedikt M. Pötscher	ETH Zurich & University of Zurich, Switzerland (invited)	On Size and Power of Autocorrelation Robust Tests
Mario Ruthmair	University of Lisbon, Portugal	Mixed Integer Linear Programming Models for the Interdependent Lock Scheduling Problem

Departmental Seminar = ISOR Colloquium

January 12	Konstantinos Fokianos (University of Cyprus)	Binary and Count Time Series Analysis
January 19	Mark Podolskij (University of Aarhus, Denmark)	Testing the rank of the volatility process in multivariate diffusion models
January 26	Vincent Guigues (UPMC - LIP6, France)	Hypotheses testing on the optimal values of several risk-neutral or risk-averse convex stochastic programs and application to hypotheses testing on several risk measure values.
March 9	Fabien Tricoire (University of Vienna, Austria)	Optimisation approaches for bi-objective stochastic logistics
March 16	Reinhard Furrer (University of Zurich, Switzerland)	Multivariate spatial modeling for large datasets: backfitting, tapering and spam
March 23	Jorge P. Zubelli (IMPA Brasil)	Project evaluation and Real Option Analysis: A Hedged Monte Carlo Approach
April 13	Jürgen Branke (University of Warwick, UK)	Integrating Preference Information into Evolutionary Multi-objective Optimization
April 20	Fabio Furini (University Paris Dauphine, France)	Approximated Perspective Relaxations: a Project&Lift Approach
April 27	Torsten Möller (University of Vienna, Austria)	Visual Tools for Decision Making
May 4	Rama Cont (Imperial College London, UK)	Fire sales, endogenous risk and price-mediated contagion: modeling, monitoring and regulation
May 11	Joaquim João Júdice (Universidade de Coimbra, Portugal)	Optimization with Linear Complementarity Constraints
May 18	Florentina Paraschiv (University of St. Gallen, Switzerland)	Optimization of hydro storage systems and indifference pricing of power contracts
June 1	Yannick Baraud (Laboratoire J. A. Dieudonné, France)	A robust and adaptive estimator for regression

June 8	Per Mykland (University of Chicago, USA)	Assessment of Uncertainty in High Frequency Data: The Observed Asymptotic Variance
June 15	Helmut Lütkepohl (FU Berlin, Germany)	Structural Vector Autoregressions with Smooth Transition in Variances: The Interaction Between U.S. Monetary Policy and the Stock Market
June 22	Claudia Czado (TU Munich, Germany)	Systemic stress testing using vine copulas
October 12	Sibel Salman (Koç University, Turkey)	Arc Routing Problems to Restore Accessibility after a Disaster
October 19	Paula A. Amaral (Universidade Nova de Lisboa, Portugal)	Infeasibility, Fractional Quadratic Problems and Copositivity
November 9	Markus Leitner (University of Vienna, Austria)	The Diameter Constrained Spanning Tree Problem: Polyhedral Study
November 16	Yuri Goegebeur (University of Southern Denmark)	Bias-corrected estimation of the stable tail dependence function
November 23	David Veredas (Vlerick Business School, Belgium)	TailCoR
November 30	Birgit Rudloff (WU Vienna, Austria)	Systemic risk and beyond: scalar versus multivariate approaches
December 7	André Lucas (VU Amsterdam, the Netherlands)	Spillover Dynamics for Systemic Risk Measurement using Spatial Financial Time Series Models
December 14	José Fernando Oliveira (Universidade do Porto, Portugal)	Recent developments on nesting problems (or, how to solve a puzzle where the pieces do not fit)

7 Grants and Externally Funded Research Projects

Immanuel Bomze (Project-Coordinator), Research Associates: Peter Dickinson, Ivana Ljubic, Markus Sinnl	Title: Stochastic Copositive Optimization Funding: OeAD – WTZ (Austria – France “Amadée”) Runtime: 2014-2015
Hannes Leeb (Project-Coordinator), Research Associate: Nina Senitschnigg	Title: Shrinkage estimators for prediction out-of-sample Funding: FWF Runtime: 2014-2016
Hannes Leeb (Project-Coordinator), Research Associates: Lukas Steinberger, Ivana Milovic	Title: Model selection and inference with sparse models when the true model need not be sparse Funding: FWF Runtime: 2015-2016
Markus Leitner (Project-Coordinator), Research Associates: Georg Brandstätter	Title: Models for Ecological, Economical, Efficient, Electric Car-Sharing (e4-share) Funding: FFG (via Joint Programming Initiative Urban Europe) Runtime: 2014-2017
Markus Leitner (Principal Investigator), Research Associates: Mario Ruthmair	Title: Optimization and Analysis of Large-Scale Networks Funding: WWTF R: 2015-2018
Georg Pflug (Project-Coordinator), Research Associates: Christine Wallisch	Title: Risk Capital Reserves for Flood Catastrophes in National and European Context Funding: Jubliäumsfonds der Österreichischen Nationalbank Runtime: 2014-2017
Walter Schachermayer (Project-Coordinator), Georg Pflug (Co-Investigator), Nikolaus Hautsch (Co-Investigator) Research Associates: Mathias Pohl, Alexander Ristig, Ludovic Tangpi	Title: Portfolio Risk and Asset Allocation - Utilizing High-Frequency Information in High Dimensions Funding: WWTF Runtime: 2015-2019

8 Research Stays at Other Institutions

	Institution	Topics	Weeks
Immanuel Bomze	University of Paris Sud, Orsay, France	Stochastic Copositive Optimization	1
Immanuel Bomze	Universidade Nova de Lisboa, Faculdade de Ciências e Tecnologia, Caparica, Portugal	Fractional Quadratic Optimization	1
Irene Klein	ETH Zurich, Switzerland	Large financial markets	1.5
Markus Leitner	University of Lisbon, Portugal	Network Optimization (Integer Programming)	1
Markus Leitner	University of Bologna, Italy	Network Optimization (Integer Programming)	1
Martin Luipersbeck	University of Padua, Italy	Steiner trees	1
Georg Pflug	University Bozen, Italy	Stochastic Optimization	1
Mario Ruthmair	University of Lisbon, Portugal	Traveling Purchaser Problem, Electric Vehicle Routing	1
Markus Sinnl	Universidad de Talca, Curico, Chile and University of Chile, Santiago, Chile	Network Design in Biology	6
Markus Sinnl	DEI, University of Padua, Italy	Steiner Trees in Graphs Bilevel Optimization	2

9 Other Faculty Activities

Editorial Work

Immanuel Bomze

Editor
- European Journal of Operational Research

Member of Editorial Board
- Advances in Data Analysis and Classification
- Central European Journal of Operations Research
- Journal of Global Optimization
- Optimization Letters
- Operations Research Perspectives

Walter Gutjahr

Associate Editor
- OR Spectrum
- Central European Journal of Operations Research

Member of Editorial Board
- EURO Journal on Decision Processes
- Swarm Intelligence

Member of Editorial Review Board
- Production and Operations Management

Nikolaus Hautsch

Associate Editor
- Journal of Applied Econometrics
- Journal of Business & Economic Statistics
- International Journal of Forecasting
- Empirical Economics
- Journal of Financial Econometrics
- Market Microstructure and Liquidity

Member of Editorial Board
- Econometrics

Hannes Leeb

Associate Editor
- Sankhya

Georg Pflug

Associate Editor
- Computational Optimization and Applications
- Computational Management Science
- Central European Journal of OR
- Austrian Journal of Statistics
- Energy Systems: Optimization, Modeling, Simulation and Economic Aspects
- Operations Research
- Journal of Stochastic Analysis
- Financial Mathematics and Applications

Benedikt M. Pötscher

Co-Editor
- Econometric Theory

Associate Editor
- Journal of Statistical Planning and Inference

Refereeing

Immanuel Bomze
- Journal of Global Optimization (2)
- Optimization Letters (2)
- Journal of Optimization Theory and Applications (1)
- Journal of Mathematical Analysis and Applications (1)
- Linear Algebra and its Applications (1)

Walter Gutjahr
- Algorithmica (1)
- Engineering Applications of Artificial Intelligence (1)
- Engineering Optimization (1)
- European Journal of Operational Research (4)
- IEEE Transactions on Cybernetics (1)
- International Journal of Production Economics (1)
- International Transactions in Operational Research (1)
- Journal of Cleaner Production (1)
- Journal of Systems Science and Systems Engineering (1)
- Journal of the Operational Research Society (1)
- Operations Research (1)
- OR Spectrum (1)
- Production and Operations Management (2)

Nikolaus Hautsch
- Journal of the American Statistical Association
- Journal of Econometrics (7)
- Journal of Finance (2)
- Journal of Business & Economic Statistics (2)
- Statistics
- Econometrics Journal
- European Central Bank
- Deutsche Forschungsgemeinschaft
- Danish Council for Independent Research

Irene Klein	▪ Finance and Stochastics (1) ▪ Mathematical Finance (1)
Hannes Leeb	▪ Mathematics of Computation (1) ▪ Journal of The Royal Statistical Society B (1) ▪ Annals of Statistics (1) ▪ Journal of The American Statistical Association (1)
Markus Leitner	▪ European Journal of Operational Research ▪ INFORMS Journal on Computing ▪ International Transactions in Operational Research ▪ Mathematical Programming Computation
Benedikt M. Pötscher	▪ Biometrika ▪ Econometric Theory ▪ Journal of the American Statistical Association ▪ Quantitative Economics ▪ Statistical Science
Mario Ruthmair	▪ American Mathematical Society - Mathematical Reviews (1) ▪ Computers and Operations Research (1) ▪ Information Sciences (1) ▪ Constraints (1)
Werner Schachinger	▪ Journal of Global Optimization ▪ OR Spectrum
Markus Sinnl	▪ European Journal of Operational Research ▪ Expert Systems with Applications ▪ Mathematical Programming Computations ▪ Mathematical Methods of OR ▪ Mathematical and Computer Modelling of Dynamical Systems

Public Relations Activities

Nikolaus Hautsch	Public Lecture at the Campus Festival 2015 – Forschung erleben & feiern: Hochgeschwindigkeit auf Finanzmärkten: Fluch oder Segen?, Vienna, June 2015

Other Professional Activities

Immanuel Bomze	▪ Management COST Meeting, Sevilla, Spain ▪ EJOR Editorial Meeting, Tours, France
Walter Gutjahr	▪ Program Committee Member GECCO 2015 ▪ Program Committee Member MIC 2015
Nikolaus Hautsch	▪ Member of the Program Committee of the Annual Conference of the Society for Financial Econometrics (SoFiE), University of Aarhus, June 2015 ▪ Member of the Program Committee of the Annual Meeting of the European Financial Management Association, June 2015 ▪ Member of the Program Committee of the "2nd Vienna Workshop on High Dimensional Time Series in Macroeconomics and Finance", Vienna, May 2015
Hannes Leeb	▪ Head of Department (Statistics and Operations Research), University of Vienna ▪ Bernoulli Society European Regional Committee ▪ Bernoulli Society ERC Conference Committee
Georg Pflug	▪ Organizer of OR2015: Big Data & Optimal Decisions – International Conference on Operations Research (Vienna) ▪ Organizer Workshop on Risk Management in Very High Dimensions (Vienna) ▪ Council member for Applied Mathematics at the Austrian Science Fund (FWF)
Benedikt M. Pötscher	▪ Faculty member of Vienna Graduate School of Economics ▪ Principal investigator of FWF-Project P 27398-G11
Werner Schachinger	▪ Deputy Director of Studies Programme Business, Economics and Statistics (University of Vienna)