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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 2014. 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 2013/14 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 2014, our department has been strengthened by the arrival of Christina Büsing, Gökhan Cebiroglu, Marek Chudy, Akos Horvath, Martin Luipersbeck, Mathias Pohl, Patrick Streif, Christine Wallisch and Christopher Walsh as assistants, Dominique Sundt as administrative assistant and Andreas Loibl as system administrator.

Regrettably, there were also several departures. Johanna Bertl, Peter Dickinson and Andreas Futschik left the department to pursue new professional opportunities. We wish them well in their new position.

I would like to express special thanks to Vera Lehmwald for editing the Annual Report 2014.

Hannes Leeb (HoD)
2 Faculty and Staff

2.1 Regular Faculty

François Bachoc (PhD)  
Gaussian Process Modeling, Covariance Function Estimation, Metamodelling and Validation of Computer Models, Small-Probability Estimation, Model Selection

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

Christina Büsing (Dr.)  
Combinatorial Optimization, Optimization under Uncertainty, Recoverable Robustness, Mixed Integer Programming

Gökhan Cebiroglu (Dr.)  

Marek Chudy (Mgr.)  
Macroeconomic Forecasting, Financial Econometrics, Model Selection Methods

Peter Dickinson (PhD)  
Copositive Optimisation, Conic Optimisation, Polynomial Optimisation

Andreas Futschik (Assoc. Prof.)  
Asymptotic Statistics, Applied Statistics, Bioinformatics

Walter Gutjahr (Prof.)  
Optimization Theory, Discrete Optimization, Stochastic Modeling, Multicriteria Decision Analysis

Nikolaus Hautsch (Prof.)  

Irene Klein (Assoc. Prof.)  
Stochastic Finance

Raimund Kovacevic (Dr.)  
Stochastic Optimization, Quantitative Risk Management, Stochastic Processes in Finance and Insurance

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
2.2 Externally Funded Faculty

Johanna Bertl (Mag.) Biostatistics, Approximate Inference
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 and Robust Optimization, Portfolio Optimization
Anna Timonina (MSc) Stochastic Optimization, Robust Optimization, System Analysis, Information Control and Processing, Data Mining
Christine Wallisch (MSc)

2.3 External Lecturers (Academic Year 2013/14)

Andreas Baierl (Dr.), Johanna Bertl (PhD), Johann Brandstetter (Dr.), Andreas Chwatal (Dr.), Marek Chudy (Mgr.), Manfred Deistler (Prof., University of Technology Vienna), Sarah Dippenaar (Mag.), Marlies Dolezal (Dr.), Evelina Erlacher (Dr.), Florian Frommlet (Privatdoz.), Angelika Geroldinger (Dr.), Alexandra Graf (Ass.-Prof.), Wilfried Grossmann (Prof., Educational Technologies, Faculty of Computer Science), Marcus Hudec (Assoc. Prof., Data Analytics and Computing, Faculty of Computer Science), Johannes Klotz (Mag.), Simon Konzett (Mag.), Carolin Kosiol (Dr.), Christoph Krall (Dr.), Eric-John Laas-Nesbitt (MSc), Markus Leitner (Dr.), Nysret Musliu (Privatdoz.), Herbert Nagel (Dr.), David Preinerstorfer (MMag.), Stefan Rath (Dr.), Peter Reiter (Dr.), Robin Ristl (Dr.), Harald Schwab (Dr.), Christian Spreitzer (Mag.), Nina Senitschnig (PhD), Lukas Steinberger (Mag.), Markus Sinnl (Dipl.-Ing.), Gabriel Strasser (Mag.), Alexander Tichy (Dr.), Anna Timonina (PhD), Gabriele Uchida
(Assoc. Prof., Data Analytics and Computing, Faculty of Computer Science), Claus Vogl (Dr.,
University of Veterinary Medicine Vienna), Johannes Wessely (Mag.)

2.4 Teaching Assistants (Academic Year 2013/14)

Bernhard Kober, Christine Wallisch

2.5 Tutors (Academic Year 2013/14)

Stefan Bock, Tinatini Buturishvili, Sarah Dippenaar, Bernhard Hrobath, Daniel Obszelka, Alexander
Ruth, Marina Stiliyanova Ivanova, Daniel Povolny, Michael Themessl-Huber, Carolina Torossian,
Zachary Valtchanoff, Christine Wallisch, Klaus Winhofer, Haimiao Zhang

2.6 Administrative Assistants

Birgit Ewald, Gerald Kamhuber, Vera Lehmwald, Manuela Nicham-Zorn, Madlen Stottmeyer,
Dominique Sundt

2.7 System Administrators

Jürgen Berlakovich, Georg Fochler, Stefan Geißler, Rolf Karner, Svetlana Mihajlovic, Andreas Loibl

3 Visitors

Reinhard Furrer (University of Zurich, Switzerland), Bernard Fortz (Université libre de Bruxelles,
Belgium), Luis Gouveia (University of Lisbon, Portugal), Marwan Lisser (Intern, France), Francesca
Maggioni (University of Bergamo, Italy), Peter Malec (University of Cambridge, UK), Axel Werner
(Zuse Institute Berlin, Germany)
4 Teaching

4.1 Theses Supervised

4.1.1 PhD Theses in Progress

<table>
<thead>
<tr>
<th>Supervisor</th>
<th>Author</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immanuel Bomze, Werner Schachinger</td>
<td>Reinhard Ullrich</td>
<td>Selecting equilibria from an ample choice</td>
</tr>
<tr>
<td>Immanuel Bomze, Ivana Ljubic</td>
<td>Markus Sinnl</td>
<td>Bi-objective optimization for telecommunication networks</td>
</tr>
<tr>
<td>Hannes Leeb</td>
<td>Ivana Milovic</td>
<td>Conditional means of low-dimensional projections from high-dimensional data. Explicit error bounds</td>
</tr>
<tr>
<td>Hannes Leeb</td>
<td>Lukas Steinberger</td>
<td>Statistical inference in high dimensional linear regression based on simple working models</td>
</tr>
<tr>
<td>Benedikt M. Pötscher</td>
<td>David Preinerstorfer</td>
<td>Autocorrelation robust testing in time series regression models</td>
</tr>
<tr>
<td>Erhard Reschenhofer</td>
<td>Marek Chudy</td>
<td>Analysis and Prediction of Economic Time Series</td>
</tr>
</tbody>
</table>

4.1.2 PhD Theses Finished

<table>
<thead>
<tr>
<th>Supervisor</th>
<th>Author</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andreas Futschik</td>
<td>Johanna Bertl</td>
<td>An approximate maximum likelihood algorithm with case studies</td>
</tr>
<tr>
<td>Walter J. Gutjahr *</td>
<td>Eeva Vilkumaa, Aalto University, Helsinki, Finland</td>
<td>Model-based decision processes for agenda building and funding</td>
</tr>
<tr>
<td>Walter J. Gutjahr *</td>
<td>Stefanie Kritzinger</td>
<td>A unified variable neighborhood search metaheuristic for solving problems in vehicle routing</td>
</tr>
<tr>
<td>Walter J. Gutjahr *</td>
<td>Attila Kovacs</td>
<td>Vehicle routing problems with service consistency considerations</td>
</tr>
</tbody>
</table>

* Reviewer
### Master Theses in Progress

<table>
<thead>
<tr>
<th>Supervisor</th>
<th>Author</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Georg Pflug</td>
<td>Theodoros Kouimtsidis</td>
<td>Systemic risk for the Austrian banking system</td>
</tr>
<tr>
<td>Erhard Reschenhofer</td>
<td>Stefan Mück</td>
<td>Applications of the dynamic conditional correlation model</td>
</tr>
</tbody>
</table>

### Master Theses Finished

<table>
<thead>
<tr>
<th>Supervisor</th>
<th>Author</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walter J. Gutjahr</td>
<td>Nada Zubur</td>
<td>Optimization of warehouse locations based on Wardrop equilibria</td>
</tr>
<tr>
<td>Walter J. Gutjahr</td>
<td>Christian Burkart</td>
<td>Competitive location models for transportation in disaster relief logistics</td>
</tr>
<tr>
<td>Walter J. Gutjahr</td>
<td>Daniel Obszelka</td>
<td>Projektportfoliooptimierung unter einem Kompetenzentwicklungsmodell</td>
</tr>
<tr>
<td>Walter J. Gutjahr</td>
<td>Johann Aigner</td>
<td>Cooling Center Standortwahlproblem am Beispiel der Stadt Wien</td>
</tr>
<tr>
<td>Erhard Reschenhofer</td>
<td>Christian Pfeiffer</td>
<td>Statistische Analyse des Ausfallrisikos von Firmenkunden im Leasinggeschäft</td>
</tr>
<tr>
<td>Erhard Reschenhofer</td>
<td>Martin Ruzek</td>
<td>Comparison of regular FX trading and FX option trading</td>
</tr>
</tbody>
</table>

### Bachelor Theses

Johanna Bertl (1), Immanuel Bomze (10), Georg Pflug (1), Erhard Reschenhofer (13)

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* Reviewer
5 Publications

5.1 Monographs


5.2 Journal Articles


### 5.3 Contributions to Proceedings and Edited Books


5.4 Working Papers


Cebiroglu, Gökhan, Horst, Ulrich: Drivers and Impact of Hidden Liquidity: Empirical Evidence from the US.

Cebiroglu, Gökhan, Grith, Maria: The Role of Delegated Trading Mechanisms in Explaining the Empirical Pricing Kernel Puzzle.

Cebiroglu, Gökhan, Hautsch, Nikolaus, Walsh, Christopher: Revisiting the Stealth Trading Hypothesis. Does Time-Varying Liquidity Explain the Size-Effect?

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 (Workshop of 11th DIMACS challenge).


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


Reschenhofer, Erhard, Chudy, Marek: Adjusting band-regression estimators for prediction: shrinkage and downweighting.

Reschenhofer, Erhard, Chudy, Marek: Imposing frequency-domain restrictions on time-domain forecasts.


Sinnl, Markus, Ljubic, Ivana: A Node-Based Layered Graph Approach for the Steiner Tree Problem with Revenues, Budget and Hop-Constraints (Workshop of 11th DIMACS challenge).

### 6 Dissemination of Research

#### 6.1 Workshops and Conferences

<table>
<thead>
<tr>
<th>Conference</th>
<th>Title of Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>EURO mini-conference on Optimization in the Natural Sciences, Aveiro, Portugal</td>
<td>Copositive relaxation beats Lagrangian dual bounds in quadrically and linearly constrained QPs</td>
</tr>
<tr>
<td>EUROPT 2014 (12th EUROPT Workshop on Advances in Continuous Optimization), Perpignan, France (invited plenary talk)</td>
<td>The role of copositivity in optimality conditions and relaxation bounds</td>
</tr>
<tr>
<td>IFORS 2014 (20th Conference of the International Federation of Operational Research Societies), Barcelona, Spain (invited stream organizer)</td>
<td>New bounds for the cp-rank in copositive optimization</td>
</tr>
<tr>
<td>Optimization 2014 Conference, Guimarães, Portugal (invited session organizer)</td>
<td>Copositive relaxation beats Lagrangian dual bounds in quadrically and linearly constrained QPs</td>
</tr>
<tr>
<td>COMPSTAT 2014 (21st International Conference on Computational Statistics), Geneva, Switzerland (invited session)</td>
<td>Robust spherical separation</td>
</tr>
<tr>
<td>MAGO 2014 (XII Global Optimization Workshop), Malaga, Spain</td>
<td>Narrowing the difficulty gap for the Celis-Dennis-Tapia problem</td>
</tr>
<tr>
<td>AIRO 2014 (44th Annual Conference of the Italian Operational Research Society), Como, Italy (invited plenary)</td>
<td>The role of copositivity in optimality conditions and relaxation bounds</td>
</tr>
<tr>
<td>New Researcher Conference 2014, Harvard University, Cambridge, Massachusetts, USA</td>
<td>Kriging models with Gaussian processes - covariance function estimation and impact of spatial sampling</td>
</tr>
<tr>
<td>Uncertainty in Computer Models Conference 2014, Sheffield, UK</td>
<td>Asymptotic analysis of the role of spatial sampling for covariance parameter estimation of Gaussian processes</td>
</tr>
<tr>
<td>11th Colloquium of Young Probabilists and Statisticians, Forge-les-Eaux, France</td>
<td>Kriging models with Gaussian processes - covariance function estimation and impact of spatial sampling</td>
</tr>
<tr>
<td>Name</td>
<td>Conference</td>
</tr>
<tr>
<td>--------------</td>
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</tr>
<tr>
<td>Gökhan Cebiroglu</td>
<td>8th World Congress of the Bachelier Finance Society, Brussels, Belgium, (invited)</td>
</tr>
<tr>
<td>Gökhan Cebiroglu</td>
<td>Workshop on New Directions in Financial Mathematics and Mathematical Economics, Banff, Canada (invited)</td>
</tr>
<tr>
<td>Walter J. Gutjahr</td>
<td>APMOD 2014 (International Conference on Applied Mathematical Optimization and Modelling), University of Warwick, Coventry, UK</td>
</tr>
<tr>
<td>Nikolaus Hautsch</td>
<td>Workshop Measuring and Modeling Financial Risk with High Frequency Data, European University Institute, Florence, Italy (invited)</td>
</tr>
<tr>
<td>Nikolaus Hautsch</td>
<td>Empirical Market Microstructure Conference, University of Cambridge, UK (invited)</td>
</tr>
<tr>
<td>Irene Klein</td>
<td>8th World Congress of the Bachelier Finance Society, Brussels, Belgium</td>
</tr>
<tr>
<td>Raimund M. Kovacevic</td>
<td>IFORS 2014 (20th Conference of the International Federation of Operational Research Societies), Barcelona, Spain (invited)</td>
</tr>
<tr>
<td>Raimund M. Kovacevic</td>
<td>CMS 2014 (11th International Conference on Computational Management Science), Lisbon, Portugal (invited)</td>
</tr>
<tr>
<td>Raimund M. Kovacevic</td>
<td>EFC14 (4th Energy Finance Christmas Workshop), St. Gallen, Switzerland (invited)</td>
</tr>
<tr>
<td>Hannes Leeb</td>
<td>ASC &amp; IMS Annual Meeting, Sydney, Australia (invited)</td>
</tr>
<tr>
<td>Name</td>
<td>Conference</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Markus Leitner</td>
<td>CIRRELT &amp; COMEX Workshop on Network Design, Montréal, Canada (invited)</td>
</tr>
<tr>
<td>Markus Leitner</td>
<td>OR2014 (International Conference of the German Operations Research Society), Aachen, Germany</td>
</tr>
<tr>
<td>Markus Leitner</td>
<td>IFORS 2014 (20th Conference of the International Federation of Operational Research Societies), Barcelona, Spain</td>
</tr>
<tr>
<td>Markus Leitner</td>
<td>ISCO 2014 (3rd International Symposium on Combinatorial Optimization), Lisbon, Portugal</td>
</tr>
<tr>
<td>Ivana Ljubic</td>
<td>SIAM Conference on Optimization, San Diego, CA, USA</td>
</tr>
<tr>
<td>Ivana Ljubic</td>
<td>ISCO 2014 (3rd International Symposium in Combinatorial Optimization), Lisbon, Portugal</td>
</tr>
<tr>
<td>Ivana Milovic</td>
<td>PhD Meeting Halle, Halle, Germany</td>
</tr>
<tr>
<td>Ivana Milovic</td>
<td>Heidelberg Laureate Forum, Heidelberg, Germany</td>
</tr>
<tr>
<td>Georg Pflug</td>
<td>Workshop Stochastic Optimization, Bad Hofgastein, Austria</td>
</tr>
<tr>
<td>Georg Pflug</td>
<td>CMS 2014 (11th International Conference on Computational Management Science), Lisbon, Portugal</td>
</tr>
<tr>
<td>Georg Pflug</td>
<td>London Optimization Workshop, King’s College, London, UK (invited)</td>
</tr>
<tr>
<td>Georg Pflug</td>
<td>Workshop Statistic &amp; Risk Modeling, Ulm, Germany (invited)</td>
</tr>
<tr>
<td>Georg Pflug</td>
<td>IFORS 2014 (20th Conference of the International Federation of Operational Research Societies), Barcelona, Spain</td>
</tr>
<tr>
<td>Conference / Presenters</td>
<td>Conference Title</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Georg Pflug</td>
<td>OR2014 (International Conference of the German Operations Research Society), Aachen, Germany</td>
</tr>
<tr>
<td>Georg Pflug</td>
<td>ECSP2014 (Euro Mini Conference Stochastic Programming and Energy Application), Paris, France (invited)</td>
</tr>
<tr>
<td>Georg Pflug</td>
<td>EFC14(4th Energy Finance Christmas Workshop), St. Gallen, Switzerland (invited)</td>
</tr>
<tr>
<td>Nina Senitschnig</td>
<td>JSM 2014 (Joint Statistical Meetings), Boston, Massachusetts, USA</td>
</tr>
<tr>
<td>Markus Sinnl</td>
<td>Workshop of the 11th DIMACS (Center for Discrete Mathematics and Theoretical Computer Science), Implementation challenge, Providence, Rhode Island, USA</td>
</tr>
<tr>
<td>Markus Sinnl</td>
<td>Workshop of the 11th DIMACS (Center for Discrete Mathematics and Theoretical Computer Science), Implementation challenge, Providence, Rhode Island, USA</td>
</tr>
<tr>
<td>Markus Sinnl</td>
<td>IFORS 2014 (20th Conference of the International Federation of Operational Research Societies), Barcelona, Spain</td>
</tr>
<tr>
<td>Markus Sinnl</td>
<td>ISCO 2014 (3rd International Symposium in Combinatorial Optimization), Lisbon, Portugal</td>
</tr>
<tr>
<td>Christopher Walsh</td>
<td>ERCIM 2014 (7th International Conference of the ERCIM WG on Computational and Methodological Statistics), Pisa, Italy</td>
</tr>
</tbody>
</table>
### 6.2 Outside Seminars

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immanuel M. Bomze</td>
<td>PGMO Seminar (Le Programme Gaspard Monge pour l'Optimisation), Fondation Hadamard, École polytechnique, Paris, France</td>
<td>Copositive relaxation beats Lagrangian dual bounds in quadrically and linearly constrained QPs</td>
</tr>
<tr>
<td>Immanuel M. Bomze</td>
<td>University of Calabria (UNICAL), Rende, Cosenza, Italy</td>
<td>Narrowing the difficulty gap for the Celis-Dennis-Tapia problem</td>
</tr>
<tr>
<td>Immanuel M. Bomze</td>
<td>Laboratory of Intelligent Decision Support Systems, Institute of Computing Science, Poznań University of Technology, Poznań, Poland (invited)</td>
<td>A nasty cone with nice properties – new issues in copositive optimization</td>
</tr>
<tr>
<td>Immanuel M. Bomze</td>
<td>Continuous Optimization Seminar, Budapest University of Technology and Economics, Institute of Mathematics (BME), Budapest, Hungary</td>
<td>Copositive relaxation beats Lagrangian dual bounds in quadrically and linearly constrained QPs</td>
</tr>
<tr>
<td>Immanuel M. Bomze</td>
<td>Bocconi University, Milan, Italy</td>
<td>A conic view of uncertainty</td>
</tr>
<tr>
<td>François Bachoc</td>
<td>Applied Statistics Group Colloquium, University of Zurich, Switzerland</td>
<td>Maximum Likelihood and Cross Validation for covariance function estimation in Gaussian process regression</td>
</tr>
<tr>
<td>François Bachoc</td>
<td>Kriging and Statistical Learning Workshop of the Manon Research Laboratory, Saclay, France</td>
<td>Introduction to Gaussian-process based Kriging models for metamodeling and validation of computer codes</td>
</tr>
<tr>
<td>Walter J. Gutjahr</td>
<td>University of Warwick, Coventry, UK</td>
<td>Multi-objective resource-constrained project scheduling under risk aversion</td>
</tr>
<tr>
<td>Nikolaus Hautsch</td>
<td>Institute for Advanced Studies, Vienna, Austria</td>
<td>Local Method of Moments Estimation of Integrated and Spot Covariation</td>
</tr>
<tr>
<td>Nikolaus Hautsch</td>
<td>University of St. Gallen, Switzerland</td>
<td>Local Method of Moments Estimation of Integrated and Spot Covariation</td>
</tr>
<tr>
<td>Nikolaus Hautsch</td>
<td>IESEG School of Management, Paris, France</td>
<td>Systemic Risk and Network Dependencies in the European Financial System</td>
</tr>
<tr>
<td>Nikolaus Hautsch</td>
<td>Leibniz University of Hannover, Germany</td>
<td>Local Method of Moments Estimation of Integrated and Spot Covariation</td>
</tr>
<tr>
<td>Nikolaus Hautsch</td>
<td>HEC Lausanne, Switzerland</td>
<td>On the Hidden Side of the Market</td>
</tr>
<tr>
<td>Institution</td>
<td>Title</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Hannes Leeb University of Cambridge, Cambridge, UK</td>
<td>On conditional moments of high-dimensional random vectors given lower-dimensional projections</td>
<td></td>
</tr>
<tr>
<td>Hannes Leeb ETH Zurich, Zurich, Switzerland</td>
<td>On conditional moments of high-dimensional random vectors given lower-dimensional projections</td>
<td></td>
</tr>
<tr>
<td>Hannes Leeb University of Bremen, Bremen, Germany</td>
<td>On conditional moments of high-dimensional random vectors given lower-dimensional projections</td>
<td></td>
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<tr>
<td>Ivana Ljubic Graz Discrete Mathematics and Optimization Seminar, TU Graz, Austria</td>
<td>The Recoverable Robust Facility Location Problem</td>
<td></td>
</tr>
<tr>
<td>Georg Pflug University of Bergamo, Italy (invited)</td>
<td>PhD course on Selected Topics in Stochastic Optimization</td>
<td></td>
</tr>
<tr>
<td>Georg Pflug Université Paris Sud, Orsay, France (invited)</td>
<td>Cours sur l’optimization stochastique</td>
<td></td>
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<tr>
<td>Georg Pflug PGMO Seminar (Le Programme Gaspard Monge pour l’Optimisation), Fondation Hadamard, École polytechnique, Paris, France (invited)</td>
<td>Multistage stochastic optimization</td>
<td></td>
</tr>
<tr>
<td>Georg Pflug FGV University, Rio de Janeiro, Brazil (invited)</td>
<td>Tutorial on scenario generation</td>
<td></td>
</tr>
<tr>
<td>Benedikt M. Pötscher Department of Economics, National University of Singapore, Singapore</td>
<td>Valid Confidence Intervals for Post-Model-Selection Predictors</td>
<td></td>
</tr>
</tbody>
</table>

6.3 **Departmental Seminar = ISOR Colloquium**

<table>
<thead>
<tr>
<th>Date</th>
<th>Speaker (Institution)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 13</td>
<td>Abdel Lisser (University of Paris-Sud, France)</td>
<td>Linear programs with Joint Probabilistic constraints</td>
</tr>
<tr>
<td>January 20</td>
<td>Alexander Aue (University of California, Davis, USA)</td>
<td>On the prediction of functional time series</td>
</tr>
<tr>
<td>January 27</td>
<td>Melanie Schienle (University of Hannover, Germany)</td>
<td>Semiparametric Estimation with Generated Covariates</td>
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<tr>
<td>March 03</td>
<td>Viktor Todorov (Northwestern University, USA)</td>
<td>Inference Theory for Volatility Functional Dependencies</td>
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<tr>
<td>March 10</td>
<td>Donald Richards (Penn State University, USA)</td>
<td>The Affinely Invariant Distance Correlation</td>
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<tr>
<td>Date</td>
<td>Speaker</td>
<td>Title</td>
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<tr>
<td>March 17</td>
<td>Robert Stelzer (University of Ulm, Germany)</td>
<td>Stochastic Volatility and Possible Long Memory: The supOU Model</td>
</tr>
<tr>
<td>March 31</td>
<td>Helmut Gfrerer (University Linz, Austria)</td>
<td>On computation of generalized derivatives of solution maps to a class of generalized equations</td>
</tr>
<tr>
<td>April 07</td>
<td>Daniel Kuhn (EPFL Lausanne, Switzerland)</td>
<td>Interdiction Games on Markovian PERT networks</td>
</tr>
<tr>
<td>April 28</td>
<td>Michael Wolf (University of Zurich, Switzerland)</td>
<td>Spectrum Estimation: A Unified Framework for Covariance Matrix Estimation and PCA in Large Dimensions</td>
</tr>
<tr>
<td>May 05</td>
<td>Markus Reiß (Humboldt University of Berlin, Germany)</td>
<td>Optimal estimation of linear functionals in irregular nonparametric models</td>
</tr>
<tr>
<td>May 12</td>
<td>Anders Rahbek (University of Copenhagen, Denmark)</td>
<td>Bootstrapping Nonstationary Heteroscedastic Vector Autoregressive Models</td>
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<tr>
<td>May 19</td>
<td>Anna Timonina (IIASA, Austria)</td>
<td>Approximation of Continuous-State Scenario Processes in Multi-Stage Stochastic Optimization and its Applications</td>
</tr>
<tr>
<td>May 26</td>
<td>Christina Büsing (RWTH Aachen University, Germany &amp; University of Vienna, Austria)</td>
<td>Multiband Uncertainties in Robust Optimization</td>
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<tr>
<td>June 02</td>
<td>Nikolaus Hautsch (University of Vienna, Austria)</td>
<td>Inaugural lecture: Hochfrequenz auf Finanzmärkten - Fluch oder Segen?</td>
</tr>
<tr>
<td>June 16</td>
<td>Gökhan Cebiroglu (University of Vienna, Austria)</td>
<td>Does Hidden Liquidity Harm Price Efficiency? Equilibrium Exposure under Latent Demand</td>
</tr>
<tr>
<td>June 30</td>
<td>Frauke Liers (University of Erlangen, Germany)</td>
<td>Exact Solution Approaches for Constrained Binary Quadratic Optimization</td>
</tr>
<tr>
<td>October 06</td>
<td>François Bachoc (University of Vienna, Austria)</td>
<td>Maximum Likelihood and Cross Validation for covariance function estimation in Gaussian process regression</td>
</tr>
<tr>
<td>October 13</td>
<td>Dennis Kristensen (University College London, UK)</td>
<td>ABC of SV: Limited Information Likelihood Inference in Stochastic Volatility Jump-Diffusion Models</td>
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<tr>
<td>October 20</td>
<td>Francis Bach (INRIA Paris, France)</td>
<td>Beyond stochastic gradient descent for large-scale machine learning</td>
</tr>
<tr>
<td>October 27</td>
<td>Wolfgang Karl Härdle (Humboldt University of Berlin, Germany)</td>
<td>TEDRIS - Tail Event Driven Risk Structures</td>
</tr>
</tbody>
</table>
November 03 Nina Senitschnig (University of Vienna, Austria)  
Shrinkage estimators for prediction out-of-sample: selection of estimators and predictive inference

November 10 Immanuel Bomze (University of Vienna, Austria)  
New bounds for the cp-rank in copositive optimization

November 17 Roland Hildebrand (Weierstrass Institute Berlin, Germany)  
Minimal zeros of copositive matrices

November 24 Teemu Pennanen (King’s College London, UK)  
Optimal investment and contingent claim valuation in illiquid markets

December 01 Frédéric Roupin (University of Paris 13, France)  
Semidefinite Optimization for solving the Quadratic Assignment Problem

December 15 Mathias Staudigl (Bielefeld University, Germany)  
On Dynamic games with incomplete information: Relations between discrete and continuous-time

7 Grants and Externally Funded Research Projects

Maarten Jansen (Project-Coordinator)  
Title: Vienna Graduate School of Economics  
Funding: FWF  
Runtime: 2010-2014

Hannes Leeb (Co-Investigator)  
Research Associate: Benedikt Pötscher

Nikolaus Hautsch (Project-Coordinator)  
Research Associate: Michael Noé  
Title: Impact and Risks of High-Frequency Trading on Global Equity Markets  
Funding: Fritz Thyssen Stiftung  
Runtime: 2012-2014

Nikolaus Hautsch (Project-Coordinator)  
Research Associate: Gökhan Cebiroglu  
Title: Econometric Modelling of Liquidity Risks, Transaction Risks and Trading Costs  
Funding: Deutsche Forschungsgemeinschaft  
Runtime: 2007-2014

Nikolaus Hautsch (Project-Coordinator)  
Research Associate: Alexander Ristig  
Title: Portfolio Risk and Asset Allocation: Utilizing High-Frequency Information in High Dimensions  
Funding: WWTF  
Runtime: 2014-2017

Immanuel M. Bomze (Project-Coordinator/Principal Investigator)  
Title: Stochastic Copositive Optimization  
Funding: OeAD – WTZ (Austria – France “Amadée”)  

Markus Leitner (Project-Coordinator)  
Research Associate: Georg Brandstätter  
Title: e4-share: Models for Ecological, Economical, Efficient, Electric Car-Sharing  
Funding: JPI (Joint Programming Initiative Urban Europe) / FFG  
Runtime: 2014-2017  
Web: http://www.univie.ac.at/e4-share
Ivana Ljubic (Project-Coordinator)  
Research Associate: Markus Leitner  
Title: Multi-Criteria Optimization of FTTx Networks  
Funding: FWF  
Runtime: 2012-2015

Ivana Ljubic (Project-Coordinator)  
Research Associates: Markus Leitner, Markus Sinnl  
Title: Network Optimization in Bioinformatics and Systems Biology  
Funding: FWF  
Runtime: 2014-2018

Christian Schlötterer (Project-Coordinator)  
Research Associate: Andreas Futschik  
Title: Doktoratskolleg Populationsgenetik  
Funding: FWF  
Runtime: 2010-2014

Hannes Leeb (Project-Coordinator)  
Research Associate: Nina Senitschnig  
Title: Shrinkage estimators for prediction out-of-sample  
Funding: FWF  
Runtime: 2014-2016

Georg Pflug (Principal Investigator)  
Research Associate: Christine Wallisch  
Title: Risk Capital Requirements for Floods in Europe  
Funding: OeNB  
Runtime: 2014-2016

Georg Pflug, Walter Schachermayer, Nikolaus Hautsch) (Sub-Project-Coordinator)  
Research Associate: Mathias Pohl  
Title: Portfolio Risk and Asset Allocation: Utilizing High-Frequency Data in High Dimensions  
Funding: WWTF  
Runtime: 2014-2017
## 8 Research Stays at Other Institutions

<table>
<thead>
<tr>
<th>Institution</th>
<th>Research Topic</th>
<th>Weeks</th>
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<tbody>
<tr>
<td>Immanuel M. Bomze</td>
<td>University of Paris Sud, Orsay, France</td>
<td>Stochastic copositive optimization</td>
</tr>
<tr>
<td>Immanuel M. Bomze</td>
<td>University of Calabria (UNICAL), Rende, Cosenza, Italy</td>
<td>Copositive approaches to Machine Learning</td>
</tr>
<tr>
<td>Immanuel M. Bomze</td>
<td>Continuous Optimization Seminar, Budapest University of Technology and Economics, Institute of Mathematics (BME), Budapest, Hungary</td>
<td>Copositive Optimization and LCP</td>
</tr>
<tr>
<td>Immanuel M. Bomze</td>
<td>University La Sapienza, Rome, Italy</td>
<td>Quadratic and polynomial optimization</td>
</tr>
<tr>
<td>François Bachoc</td>
<td>University of Zurich, Switzerland</td>
<td>Covariance tapering</td>
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<tr>
<td>Nikolaus Hautsch</td>
<td>University of Cambridge, UK</td>
<td>High-Frequency Econometrics</td>
</tr>
<tr>
<td>Markus Leitner</td>
<td>University of Lisbon, Portugal</td>
<td>Diameter Constrained Spanning Trees</td>
</tr>
<tr>
<td>Markus Leitner</td>
<td>Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation (CIRRELT), Montréal, Canada</td>
<td>Fixed-Charge Network Design</td>
</tr>
<tr>
<td>Georg Pflug</td>
<td>University of Bergamo, Italy</td>
<td>Stochastic Optimization</td>
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<tr>
<td>Georg Pflug</td>
<td>FGV University, Rio de Janeiro, Brazil</td>
<td>Scenario generation</td>
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<tr>
<td>Markus Sinnl</td>
<td>University Paris-Dauphine, Paris, France</td>
<td>The lazy bureaucrat problem</td>
</tr>
<tr>
<td>Markus Sinnl</td>
<td>DEI, University of Padua, Italy</td>
<td>Steiner Trees in Graphs</td>
</tr>
</tbody>
</table>
9 Other Faculty Activities

9.1 Editorial Work

Immanuel M. Bomze
- Advances in Data Analysis and Classification (Member of Editorial Board)
- Central European Journal of Operations Research (Member of Editorial Board)
- European Journal of Operational Research (Editor)
- Journal of Global Optimization (Member of Editorial Board)
- Optimization Letters (Member of Editorial Board)
- Operations Research Perspectives (Member of Editorial Board)

Walter J. Gutjahr
- Advances in Operations Research (Member of Editorial Board)
- Central European Journal of Operations Research (Associate Editor)
- EURO Journal on Decision Processes (Member of Editorial Board)
- OR Spectrum (Associate Editor)
- Swarm Intelligence (Member of Editorial Board)

Nikolaus Hautsch
- Journal of Financial Econometrics (Associate Editor)
- Empirical Economics (Associate Editor)
- Econometrics (Member of Editorial Board)
- Market Microstructure and Liquidity (Associate Editor)

Hannes Leeb
- Sankhya (Associate Editor)

Georg Pflug
- Statistics and Risk Modeling (Past Editor-in-Chief)
- Computational Optimization and Applications (Associate Editor)
- Computational Management Science (Associate Editor)
- Central European Journal of Operations Research (Associate Editor)
- Austrian Journal of Statistics (Associate Editor)
- Energy Systems: Optimization (Associate Editor)
- Modeling, Simulation and Economic Aspects (Associate Editor)
- Operations Research (Associate Editor)
- Journal of Stochastic Analysis (Associate Editor)
- Financial Mathematics and Applications (Associate Editor)

Benedikt M. Pötscher
- Econometric Theory (Co-Editor)
- Journal of Statistical Planning and Inference (Associate Editor)

9.2 Refereeing

Johanna Bertl
- Molecular Ecology (1)

Immanuel M. Bomze
- Journal of Global Optimization (1)
- Optimization Letters (2)
- Linear Algebra and its Applications (1)

Gökhan Cebiroğlu
- Quantitative Finance (1)

1 incomplete list
Walter J. Gutjahr  
- Central European Journal of Operations Research (4)  
- European Journal of Operational Research (3)  
- Evolutionary Computation (1)  
- International Journal of Parallel, Emergent and Distributed Systems (1)  
- International Journal of Production Research (1)  
- Journal of Cleaner Production (1)  
- Omega (1)  
- Swarm Intelligence (1)  
- Theoretical Computer Science (1)  
- Transactions on Evolutionary Computation (1)  
- Transportation Research Part E (2)  

Nikolaus Hautsch  
- Allgemeines Statistisches Archiv  
- Journal of Applied Econometrics  
- Journal of Econometrics  
- Journal of Economic Dynamics and Control  
- Journal of Finance  
- Deutsche Forschungsgemeinschaft (3)  

Irene Klein  
- Electronic Journal of Probability (1)  
- Mathematical Finance (1)  

Hannes Leeb  
- Journal of Econometrics (1)  
- Journal of the American Statistical Association (1)  
- Annals of Statistics (1)  
- IEEE Transactions on Information Theory (1)  
- Mathematics of Computation (1)  
- Netherlands Organisation for Scientific Research (NWO) (1)  

Markus Leitner  
- Central European Journal of Operations Research  
- Computational Optimization and Applications  
- INFORMS Journal on Computing  
- Journal of Heuristics  
- Networks  

Benedikt M. Pötscher  
- Journal of the Royal Statistical Society - Series B  

Werner Schachinger  
- Journal of Optimization Theory and Applications  
- Electronic Journal of Linear Algebra  

Markus Sinnl  
- European Journal of Operational Research  
- Journal of Combinatorial Optimization  
- Naval Research Logistics  
- Systems Science and Control Engineering  
- Proceedings of ISCO2014  

Nina Senitschnig  
- Computational Statistics and Data Analysis (1)  
- European Journal of Operational Research (1)
9.3 Public Relations Activities

Nikolaus Hautsch  
Public Lecture, Finance Fusion Finanzmesse, Vienna University of Economics and Business, Vienna, Austria, October 2014

Nikolaus Hautsch  
Public Lecture, Katholischer Akademikerverband, Vienna, Austria, November 2014

9.4 Other Professional Activities

Immanuel M. Bomze  
• Deputy Director of studies Ph.D. program, University of Vienna, Austria
• Management Committee Meeting COST TD1207, University of Klagenfurt, Austria
• EJOR Editorial Meeting, Institute of Computing Science, Poznań University of Technology, Poland
• EJOR Editorial Meeting, University of Bocconi, Milano, Italy

Walter J. Gutjahr  
• Member of Program Committee, ANTS 2014
• Member of Program Committee, EvoCOP 2014
• Member of Program Committee, EvoCOP 2015
• Member of Program Committee, EMO 2015
• Member of Program Committee, FOGA 2015
• Member of Program Committee, GECCO 2014
• Member of Program Committee, LION 2014
• Member of Program Committee, PPSN 2014

Nikolaus Hautsch  
• Co-Organizer (jointly with Markus Bibinger and Markus Reiß) of the Workshop on Recent Advances in High-Frequency Statistics, Berlin, Germany
• Member of Program Committee, 21st Annual Meeting of the German Finance Association and 13th Symposium on Finance, Banking, and Insurance, Karlsruhe, Germany, December 2014
• Member of Program Committee, BdF-ACPR-SoFiE Conference “Systemic Risk and Financial Regulation”, Paris, France, July 2014
• Member of Program Committee, Annual Conference of the “Verein für Socialpolitik”, Hamburg, Germany, September 2014
• Member of Program Committee, Annual Conference of the Society for Financial Econometrics (SoFiE), University of Toronto, Canada
• Member of Ph.D. Committee of Sebastian Trojan, “Essays on Multivariate Stochastic Volatility”, University of St. Gallen, Switzerland

Irene Klein  
• Deputy Head of Department (since October)
• Member of Curriculum Working Group for Bachelor Studies

Raimund M. Kovacevic  
• Organizer of session “Pricing of Energy Derivatives”, CMS 2014, Lisbon, Portugal
Markus Leitner
- Co-Organizer of the workshop “Combinatorial Optimization for Personalized Medicine”, University of Vienna, Austria, 2014
- Co-Organizer of the workshop “Routing and Networks”, University of Vienna, Austria, 2014
- Co-Leader of the Austrian Network Optimization Group (working group of the Austrian Society of Operations Research)

Hannes Leeb
- Head of Department (since January)
- Bernoulli Society European Regional Committee
- Bernoulli Society ERC Conference Committee

Georg Pflug
- Organizer of the EURO Winter School on Stochastic Programming, Bad Hofgastein, Austria, March 23-28
- Council Member for Applied Mathematics at the Austrian Science Fund (FWF)

Benedikt M. Pötscher
- Deputy Director of Studies Programme Business, Economics and Statistics, University of Vienna, Austria (until September)
- Faculty member of Vienna Graduate School of Economics
- Member of ASA and IMS

Werner Schachinger
- Deputy Director of Studies Programme Business, Economics and Statistics, University of Vienna, Austria (since October)