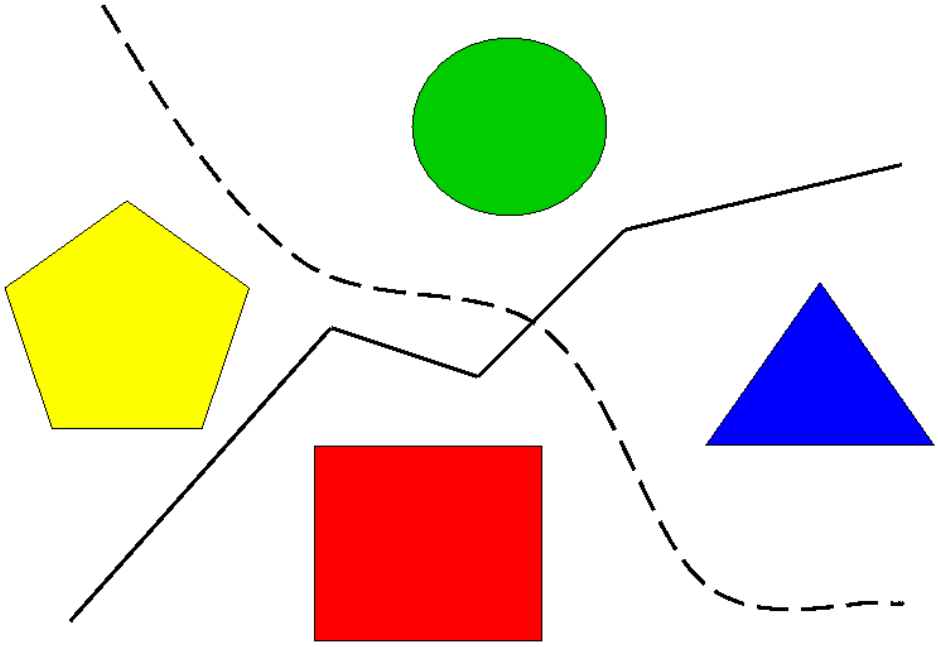
Universität Dortmund

2. Herbstkolloquium des Graduiertenkollegs

"Statistische Modellbildung"



Statistische Modellbildung

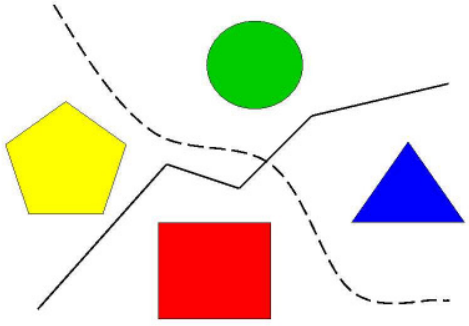
Zu diesem Kolloquium wird eingeladen

am Freitag/Samstag, 25./26. November 2005,

im UNIVERSITÄTSKOLLEG BOMMERHOLZ
- Lehr- und Weiterbildungsstätte der Universität Dortmund -
Bommerholzer Straße 60, 58456 Witten.
(Tel.: 02302/39 60, Fax: 02302/39 63 20)

2. Herbstkolloquium

des Graduiertenkollegs "Statistische Modellbildung"



Freitag, 25. November 2005

Abfahrt nach Witten: **ab Dortmund gegen 14.00 Uhr**

Vortragsprogramm I

15.30 h **Begrüßung durch den Sprecher des Graduiertenkollegs**
Prof. Dr. Joachim Hartung

15.45 h **Sophie Ladoucette**
Department of Mathematics
Catholic University of Leuven, Belgien

Asymptotic results in large claims reinsurance & asymptotic behaviour of some risk measures

16.30 h **Bernd Wilfling**
Fachbereich Wirtschaftswissenschaften
Westfälische Wilhelms-Universität Münster

Markov-switching models in financial applications

17.15 h **Göran Kauermann**
Fakultät für Wirtschaftswissenschaften
Universität Bielefeld

Penalized spline smoothing and generalized linear mixed models – Some theory and applications

Diskussion zu den Projektbereichen

19.00 h **Vorstellung der Mitglieder des Kollegs**
Einführung in die Posterausstellung
Präsentation der Dissertations- und Postdoc-Projekte
Diskussion in Arbeitsgruppen

Samstag, 26. November 2005

Vortragsprogramm II

9.00 h	**Céline le Bailly** Institute of Statistics Catholic University of Leuven, Belgien	**Uncertainty propagation in multiresponse optimization using a desirability index**
9.45 h	**Henry Wynn** Department of Statistics London School of Economics, England	**Some application of algebraic statistics**

10.30 h Pause

Vortragsprogramm III

11.00 h	**Andrew Thomas** Rolf Nevanlinna Institute Helsinki, Finnland	**Making BUGS Open**
11.45 h	**Martin Posch** Insitut für Medizinische Statistik Medizinische Universität Wien, Österreich	**Single and two stage designs for experiments with a large number of hypotheses**

12.30 h Pause

Vortragsprogramm IV

14.00 h	**Hans-Joachim Lenz** Fachbereich Wirtschaftswissenschaften Freie Universität Berlin	**OLAP schemata for correct applications**
14.45 h	**Philipp Sibbertsen** Fachbereich Wirtschaftswissenschaften Universität Hannover	**Distinguishing between long memory and near unt roots**

15.30 h Abschlußbesprechung und Diskussion

Céline Le Bailly:

Uncertainty Propagation in Multiresponse Optimization using a Desirability Index

Optimizing the quality of a product is widespread in the industry. Products have to be manufactured such that they best fit some quality properties. Varying the product settings leads to different product qualities and the aim of the manufacturer is to find the factors settings that simultaneously optimize the quality properties.

The classical approach to solve such optimization problem is based on response surface methodology. First, a designed experiment is used to collect data and to adjust models capturing the relationship between the responses of interest and the factors settings. Those fitted models can then predict the quality properties for any design point of the experimental domain.

Secondly, a desirability index is built to combine the predicted properties into a value belonging to the [0,1] interval. This index provides a ranking of possible factors settings in the solutions space and the optimum can be found by an adequate optimization algorithm. But, as model predictions are suiled with error, so is the desirability index and the optimal solution found.

In practice, in the related literature and design of experiment software, this error is neglected. This paper proposes an optimization methodology based on the fact that a desirability index is a random variable. The expectation of this index is taken as the criteria to be optimized and, since it can only be estimated, confidence and predicted intervals are constructed to take into account the propagation of the models error on the expected or predicted desirability index.

The stochastic character of the index leads also to an uncertainty on the optimum and a methodology is proposed to build an equivalence zone containing no significantly different optimal solutions. This methodology is illustrated on a simulated example and compared to the classical optimization methodology.

Hans-Joachim Lenz, Bernd Thalheim:

OLAP Schemata for Correct Applications

OLAP applications are currently widely used in business applications. These applications are implicitely defined on top of OLTP systems. The applications make use of aggregation functions and data combinations. A number of paradoxes is observed if arbitrary aggregation functions and combinations are used. We develop a theory of aggregation functions, OLTP-OLAP transformations, and of the data cube. Based on these investigations we derive an architecture for OLTP-OLAP applications that supports sound and correct querying: OLTP-OLAP specification frames. The specification frame of OLTP-OLAP schemata specifically emphasises soundness of all operations involved by built-in guards. Or to turn it around, we make provision that an innocent user does not start non-sense operations. This specification frame is based on OLTP schemata, OLTP-OLAP transformations, and a rigid theory of OLAP schemata and functions.

Keywords: OLAP, cube operator, ALL, summarizability, non-commutative operators

(Zu diesem Vortrag ist auch ein Paper verfügbar; vgl. Kopien oder direkt im Kolleg-Sekretariat)

Martin Posch, Sonja Zehetmayer, Andreas Futschik, and Peter Bauer:

Single and Two Stage Designs for Experiments with a Large Number of Hypotheses

We consider situations where a large number of hypotheses is tested but the overall number of observations is limited. In classical single stage designs the observations are distributed over all hypotheses leading to a typically small sample size and low power per hypothesis. We show that often efficiency can be gained if only a smaller number of hypotheses is selected from the pool of initially considered hypotheses such that a larger number of observations is available for each hypothesis. This holds, even if the hypotheses are selected at random. A further impressive gain in power is achieved if the total number of observations is split up in two stages. In the first stage a part of the observations is distributed among all hypotheses. For the second stage only hypotheses with promising interim results are selected. The remaining observations are distributed only over the selected hypotheses resulting in a larger second stage sample size for each selected hypothesis. The two stage designs are strikingly more efficient than single stage designs with the same total number of observations.

Andrew Thomas:

Making BUGS open

BUGS is a long running software project aiming to make modern MCMC techniques available to applied statisticians in an easy to use package. With the growing popularity of Open Source software it has been decided to release the source code to BUGS on the web. The BUGS user community is encouraged to improve and extend the software. This talk will give an overview of the structure of the BUGS software and the tools used in it creation and maintenance. Interfacing BUGS to other statistical software, such as R will also be discussed.

Bernd Wilfling:

Markov-switching models in financial applications

The talk is based upon two papers which abstracts are given below:

Institutional Investors and Stock Returns Volatility: Empirical Evidence from a Natural Experiment (Martin T. Bohl, Janusz Brzeszczyński, Bernd Wilfling)

In this paper, we provide empirical evidence on the impact if institutional investors on stock market returns dynamics. The Polish pension system reform in 1999 and the associated increase in institutional ownership due to the investment activities of pension funds are used as a unique institutional characteristic. Performing a Markov-Switching-GARCH analysis we find empirical evidence that the increase of institutional ownership has temporarily changed the volatility structure of aggregate stock returns. However, the results are interpretable in favor of a stabilizing effect on index stock returns induced by institutional investors.

Key words: Institutional traders, Polish stock market, pension fund investors, stock market volatility, Markov-Switching-GARCH model

Volatility regime-switching in European exchange rates prior to monetary unification
(Bernd Wilfling)

Several theoretical models suggest that the mere announcement of entering a currency union in the future triggers instantaneous changes in exchange-rate volatility. First, this paper develops a Markov-switching framework by which, in fact, volatility regime-switching in foreign exchange rates can be detected for nearly all currencies in the run-up to the European Monetary Union (EMU). Second, the paper attributes the currency-specific volatility regime-switches to decisive economic, institutional and political factors prior to EMU. All in all, the empirical results suggest that for all future EMU accession countries volatility regime-switching models provide a useful tool for a broad range of financial applications (e.g. for the pricing of currency options or for the construction of EMU probability calculators).

Key words: EMU, exchange-rate volatility, Markov-switching volatility modelling, EMU uncertainty

Henry Wynn:

Some application of algebraic statistics

Algebraic statistics is the term used for the application of computational algebraic geometry to statistics. This covers in particular applications to experimental design, to categorical data analyisis and to the integration of the two. The common theme is polynomials. In design these can be used to capture design points and for categorical models they are used to express the factorizations of probabilities which arise from, say, independence and conditional independence models. If the support of a discrete distribution is considered in the same way as a design (and may indeed be designed in some cases) then both support and probability models can be considered in the same framework. This helps make use of powerful symbolic packages. The talk spends a little time on the theory, but concentrates on examples of practical nature where the methods have advantages.