

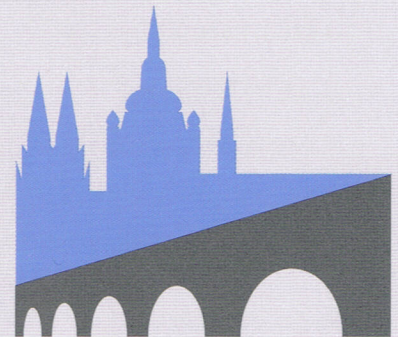
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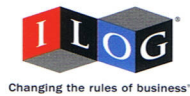
Prague, July 8 - 11, 2007

# Book of Abstracts

22<sup>nd</sup> EUROPEAN CONFERENCE ON OPERATIONAL RESEARCH



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### 3 - Parametric Analysis in Conic Linear Optimisation

Oleksandr Romanko, Computing and Software, McMaster University, 1280 Main Street West, L8S4K1, Hamilton, Ontario, Canada, romanko@mcmaster.ca, Tamas Terlaky, Alireza Ghaffari Hadigheh

We describe Interior Point Method and optimal partition based techniques for conducting parametric and sensitivity analysis of Conic Linear Optimisation problems. A general case of simultaneous perturbation in the coefficient vector of the linear term of the objective and in the right-hand side vector of the constraints is assumed. We will discuss both theoretical and implementation issues for parametric optimisation algorithms that are already developed or may be developed in the future. We also briefly outline applications of parametric optimisation in multi-objective modelling and finance.

### 4 - One-parametric Programs with Complementarity Constraints: A Genericity result of the five types of Jongen-Jonker-Twilt.

Georg Still, Mathematics, University of Twente, P.O.Box 217, 7500 AE, Enschede, Netherlands, g.still@math.utwente.nl, Juergen Guddat

One-parametric mathematical programs with complementarity constraints are considered. The structure of the set of generalized critical points is analyzed for the generic case. This analysis can locally be reduced to the study of appropriate standard one-parametric problems. A genericity result of the 5 types of Jongen, Jonker and Twilt is proven. However some effects differ from the situation in standard programming. The present investigations give the basis for path-following methods for solving one-parametric mathematical programs with complementarity constraints.

## TC-08

Tuesday, 13:00-14:30

Room RB 207

### Vector and Set-Valued Optimisation II

Stream: Vector and Set-Valued Optimisation

Invited session

Chair: *Bienvenido Jimenez*, Departamento de Matemática Aplicada, UNED, Calle Juan del Rosal, 12, 28040, Madrid, Spain, bjimenez@ind.uned.es

### 1 - Recognition, Classification and Clustering of 3D Objects through Operational Research and Multivariate Statistical Analysis Techniques

Miguel Adan, Applied Mathematic, UCLM, E.u.i.t.a., Rda. Calatrava 5, 13071, Ciudad Real, Spain, miguel.adan@uclm.es, Antonio Adan

This work is devoted to presenting solutions to object recognition, classification and clustering problems (RCCP) under low computational cost and high efficiency requirements. The selection and extraction of 3D geometric features as well as the definition of similarity measures become essential points. We can consider each object as one point inside a multidimensional space and our similarity measure provides a close relationship among objects. The RCCP success depends on the own similarity measure. Since several objectives can be considered a multi-objective problem arises.

### 2 - Duality gap in vector optimization

Giancarlo Bigi, Dipartimento di Informatica, Università di Pisa, Largo B.Pontecorvo 3, 56127, Pisa, giancarlo.bigi@di.unipi.it

In scalar optimization duality gap means the difference between the optimal values of a given problem and its dual. Such a definition can't be applied to vector optimization easily, since a vector program has a set of optimal values. Though many papers about duality for vector optimization have been published, thoroughgoing studies about the duality gap have not been carried out. As the first difficulty to overcome is the definition of duality gap itself, the aim of this talk is to address possible answers, providing some numerical measure to evaluate vector gaps.

## TC-09

Tuesday, 13:00-14:30

Hall B

### Malmquist and Beyond

Stream: DEA and Performance Measurement

Invited session

Chair: *Konstantinos Bakoulas*, Operations Information Management Group, Aston Business School, Aston Triangle, B4 7ET, Birmingham, k.bakoulas@aston.ac.uk

### 1 - Measuring Productivity for State and Private Educational Institutions in the Philippines

Mary Caroline Castano, College of Commerce; Graduate School, University of Santo Tomas, Espana, Manila, Philippines, 1008, Manila, Philippines, carol.castano@yahoo.com, Emilyn Cabanda

Productivity is compared and measured among state universities and private educational institutions in the Philippines, using data envelopment analysis-Malmquist productivity index model. Findings reveal that state universities have higher efficiency changes (all in technical, pure and scale components) than private institutions and found to be statistically significant. In technological change, private institutions have statistically significant better performance than state counterparts. Lastly, private institutions show a quite higher productive performance than state universities.

### 2 - Comparison of two alternative store formats using a Malmquist-type index

Clara Vaz, Escola Superior de Tecnologia e de Gestão, Instituto Politécnico de Bragança, Campus de Santa Apolónia, Apartado 134, 5301 - 857, Bragança, Portugal, clvaz@ipb.pt, Ana Camanho

This paper explores the differences in performance between two groups of retailing stores that operate with different formats. The study described in this paper combines the use of a Malmquist-type index (in a static setting) with statistical tests. This index is decomposed into sub-indices for comparing the efficiency spread between groups and the productivity differences between the best-practice frontiers of the groups. The hypothesis tests are used to verify if the differences between groups captured by the Malmquist-type index and its components are statistically significant.

### 3 - Group-wise decomposition of the Malmquist Index

Emmanuel Thanassoulis, Aston Business School, Aston University, Operations and Information Management, B4 7ET, Birmingham, United Kingdom, e.thanassoulis@aston.ac.uk, Giannis Karagiannis

DMUs performing a given function can be hierarchical. E.g. pupil within class, within school etc. DEA and SFA can be used to address the question of whether the units of a given group are inherently more efficient than those of another. There has not been similar work comparing groups on productivity change over time. We develop a two-stage decomposition of the Malmquist productivity index that explicitly takes into account the hierarchical structure of the units capturing the impact on productivity change due to each level of hierarchy.

### 4 - An Assessment of Efficiency and Productivity Change of Central Administrative Services of UK Universities using Data Envelopment Analysis

Konstantinos Bakoulas, Operations Information Management Group, Aston Business School, Aston Triangle, B4 7ET, Birmingham, k.bakoulas@aston.ac.uk, Emmanuel Thanassoulis

Administrative costs represent a large proportion of university expenditure. To date there has been little investigation to the efficiency of these services in terms of costs. This paper presents an assessment of Central Administrative Services of UK Universities on cost efficiencies. DEA is used to compute the cost efficiencies and Malmquist indices of productivity change over a six year period (1999/00-2004/05). Productivity change is decomposed into efficiency change and boundary shift to identify the factors underlying the change in the productivity of each institution's administration.