EURO XXIII BONN

23rd EUROPEAN CONFERENCE ON OPERATIONAL RESEARCH

Bonn, July 5 - 8, 2009

BOOK OF ABSTRACTS

UNIVERSITÄT SIEGEN

Ministerium für Innovation, Wissenschaft, Forschung und Technologie des Landes Nordrhein-Westfalen

EURO

Deutsche Forschungsgemeinschaft DFG

GOR

INFORM

WELCOME

I am delighted to welcome you to EURO XXIII.

What a wonderful opportunity to enrich our social and intellectual capital in the historic and artisic city of Bonn. I would like to congratulate everyone involved in laying the foundations for what promises to be an excellent conference. It will be the third EURO conference in a row to attract a record breaking number of papers, for the first time exceeding 2000. EURO's overarching objectives are to advance knowledge, interest and education in OR and this growth is encouraging evidence of continuing achievement. This is particularly so in the current challenging economic times – but may also be a reflection of the benefit that OR can bring to organisations in such a climate, helping them to define their core values, identify and achieve "value for money" and, as the conference theme reminds us, to create competitive advantage.

The conference is an opportunity for us to celebrate success. We will do this in many ways, such as the conferment of a range of EURO awards, including the new medal for distinguished service to EURO. However, the true success of the conference will be realised through the active participation of all of us – I hope that everyone will leave feeling personally enriched, I know that the discipline of OR will be.

Valerie Belton
President of EURO

WELCOME

Dear participant,

Welcome to the EURO conference 2009. We are happy to have you here in Bonn!

The first meeting in this series took place in Brussels, way back in 1975. At that time the meeting consisted of 120 presentations that attracted 500 participants. A lot of time has passed since then, and the present conference is already the 23rd meeting in the series. And the conference has grown beyond all our expectations: This year we will have over 2000 presentations and over 2200 participants! This makes EURO'2009 by far the largest EURO conference ever, and we are proud to host far more than 800 Non-European delegates in Bonn. Because of this large number of delegates, the Programme Committee decided that regular sessions will be allotted 80 minutes (instead of the 90 minutes at previous conferences). Future organisers will have to find other solutions to create a pleasant schedule, and perhaps this is the right moment for extending the conference to a four-day-event.
Over the years the EURO conferences have not only grown with respect to volume. They also have expanded into new areas of application, and they have opened up into new research directions. For example: 20 years ago EURO still did not cover the area of computational biology. Or: 10 years ago EURO still did not cover the area of algorithmic game theory. This permanent development and permanent adaption to new challenges (we could perhaps also say: this preservation of favourable variations, and the destruction of injurious variations) is the principal factor of our strength, and it is the key to our future success.

The conference theme is OR creating competitive advantage, and a number of our keynote speakers will develop their ideas on this. Furthermore, you will find that several of the streams and many of the contributed talks are centered around this theme.

And finally we would like to thank you, dear participant, personally for your contribution in making this conference a big success. We hope that while you are experiencing the exciting atmosphere of this event, you will gain many new insights and learn about the fascinating new developments in Operations Research.

Have a pleasant stay in Bonn!

Erwin Pesch
Chair of the Organising Committee

Gerhard J. Woeginger
Chair of the Programme Committee

PROGRAMME AND ORGANISING COMMITTEE

Organising Committee

Chair:
Erwin Pesch, University of Siegen, Germany

Co-Chair:
Peter Letmathe, University of Siegen, Germany

Josef Jablonsky, University of Economics, Prague, Czech Republic
Florian Jaehn, University of Siegen, Germany
José P. Paixao, University of Lisbon, Portugal
Gerhard Wäscher, University of Magdeburg, Germany
Gerhard-Wilhem Weber, Middle East Technical University, Ankara, Turkey

Programme Committee

Chair:
Gerhard Woeginger, University of Eindhoven, Netherlands

Horst Hamacher, Technical University of Kaiserslautern, Germany
Graham Kendall, University of Nottingham, United Kingdom
Bernhard Korte, University of Bonn, Germany
Jan Karel Lenstra, CWI Amsterdam, Netherlands
Ulrike Leopold-Wildburger, University of Graz, Austria
Silvano Martello, University of Bologna, Italy
Benny Moldovanu, University of Bonn, Germany
George Nemhauser, Georgia Institute of Technology, USA
Erwin Pesch, University of Siegen, Germany
Juan-José Salazar-González, University of La Laguna, Spain
Roman Słowiński, University of Poznan, Poland
Gerhard-Wilhelm Weber, Middle East Technical University, Ankara, Turkey

OVERVIEW OF THE PROGRAMME

Monday, July 6, 2009

Start	End	Type of Session
8:00	9:20	Sessions
9:45	11:45	Opening Session, Room: Hall Maritim
12:00	13:20	Sessions
13.35	14:55	Sessions
15:20	16:10	**Reinhard Selten** Chair: Benny Moldovanu Room: Hall Maritim
16:20	17:10	**Christos Papadimitriou** Chair: Benny Moldovanu Room: Hall Maritim
17:25	18:45	Sessions

Tuesday, July 7, 2009

Start	End	Type of Session		
8:00	9:20	Sessions		
9:35	10:20	**Noam Nisan** Chair: Michel Gendreau Room: Hall Beethoven	**Rainer Burkard** Chair: Ulrike Leopold-Wildburger Room: Hall Schumann	**Ramji Balakrishnan** Chair: Peter Letmathe Room: Hall Reger
10:20	11:05	**Ulrich Dorndorf** Chair: Erwin Pesch Room: Hall Beethoven	**Franz Rendl** Chair: Ulrike Leopold-Wildburger Room: Hall Schumann	**Bernard Roy / José Figueira** Chair: Roman Słowiński Room: Hall Reger
11:20	12:40	Sessions		
12:55	14:15	Sessions		
14:30	15:50	Sessions		
16:05	17:25	Sessions		
17:40	18:25	Sessions		

Wednesday, July 8, 2009

Start	End	Type of Session		
8:00	9:20	Sessions		
9:35	10:20	**Toshihide Ibaraki** Chair: Endre Boros Room: Hall Beethoven	**Rolf Möhring** Chair: Silvano Martello Room: Hall Schumann	**Gideon Weiss** Chair: Gerhard-Wilhelm Weber Room: Hall Reger
10:20	11:05	**Salvatore Greco** Chair: Roman Słowiński Room: Hall Beethoven	**Andrea Lodi** Chair: Paolo Toth Room: Hall Schumann	**Hubertus Jongen** Chair: Gerhard-Wilhelm Weber Room: Hall Reger
11:20	12:40	Sessions		
12:55	14:15	Sessions		
14:30	15:15	**Nitin Saxena** Chair: Gerhard Woeginger Room: Hall Beethoven	**Edmund Burke** Chair: Graham Kendall Room: Hall Schumann	**GOR Science Award** Chair: Rolf Möhring Room: Hall Reger
15:15	16:00	**Jens Vygen** Chair: Gerhard Woeginger Room: Hall Beethoven	**Michael Trick** Chair: Jacek Błażewicz Room: Hall Schumann	
16:15	17:00	Closing Session, Room: Hall Beethoven		

SPEAKER INFORMATION

Audio/Visual Equipment

Every room is equipped with a desktop PC connected to a LCD projector. The computers contain up-to-date software for the main presentation formats (PowerPoint, PDF, PostScript) and have USB connections for memory cards. You can either use your laptop or transfer your presentation onto the desktop. Overhead transparency projectors will be provided as needed. Please make sure to arrive at your session at least ten minutes before its scheduled start. Before the session begins, all presenters should set up and test their presentation and the connection with the LCD projector.

Speaker Information

The location of your session is shown in the Abstracts section of the Conference Programme book. Please be on time for your session, check in with the session chair, and test the A/V equipment. Time your presentation to fit the allotted time (26 minutes for 3 speakers, 20 minutes for 4 speakers and 16 minutes for 5 speakers in a session), allowing time for questions and audience participation. Presentations should be limited to key issues with a brief summary. Feel free to bring along copies of your paper to distribute or to provide a handout with related information.

Session Chairs

The role of the chair is to ensure the smooth execution of the session. Make sure to:

- Contact the speakers before the session, to verify who will present and to pre-empt any technical problems.
- Begin the session on time. Each session lasts 80 minutes, with equal time allotted for each presentation in the session.
- Keep presentations in the order shown in the programme, to allow participants to jump between sessions.
- Introduce the speaker and the title of each presentation.
- Express visually to the speaker how many minutes (10, 5, 2) are left, using either your hands or prepared cards.
- Ensure that the presentations, including questions, do not overstep their time frame (26 minutes for 3 speakers, 20 minutes for 4 speakers and 16 minutes for 5 speakers in a session).
- At the end of each presentation ask for questions and thank the speaker.

EURO CONFERENCE STATISTIC

Number of Presentations: 2182

Number of Registrations: 2223

Country	No.	Country	No.	Country	No.	Country	No.
Algeria	21	Ethiopia	1	Luxembourg	4	Singapore	5
Argentina	3	Finland	18	Malaysia	4	Slovakia	3
Australia	24	France	118	Mexico	8	Slovenia	13
Austria	44	Germany	470	Netherlands	76	South Africa	7
Belarus	8	Ghana	2	New Zealand	3	Spain	154
Belgium	51	Greece	48	Nigeria	4	Sweden	12
Brazil	36	Guatemala	1	Norway	27	Switzerland	36
Brunei Darussalam	1	Hong Kong	14	Pakistan	2	Taiwan	35
Canada	24	Hungary	14	Philippines	1	Thailand	1
Chile	17	India	9	Poland	58	Tunisia	6
China	10	Iraq	1	Portugal	82	Turkey	162
Colombia	9	Ireland	4	Republic of Korea	2	Uganda	1
Croatia	11	Islamic Republic of Iran	23	Republic of Moldova	2	Ukraine	12
Cyprus	1	Israel	17	Romania	9	United Arab Emirates	1
Czech Republic	36	Italy	103	Russian Federation	28	United Kingdom	129
Denmark	28	Japan	49	Saudi Arabia	2	United States	93
Egypt	1	Lebanon	1	Senegal	1	Venezuela	3
Estonia	1	Lithuania	3	Serbia	14	Viet Nam	1

This information is valid as of June 5, 2009.

EURO CONFERENCE HISTORY

K	Year	City	Country	K	Year	City	Country
1	1975	Brussels	Belgium	13	1994	Glasgow	United Kingdom
2	1976	Stockholm	Sweden	14	1995	Jerusalem	Israel
3	1979	Amsterdam	Netherlands	15	1997	Barcelona	Spain
4	1980	Cambridge	United Kingdom	16	1998	Brussels	Belgium
5	1982	Lausanne	Switzerland	17	2000	Budapest	Hungary
6	1983	Vienna	Austria	18	2001	Rotterdam	Netherlands
7	1985	Bologna	Italy	19	2003	Istanbul	Turkey
8	1986	Lisbon	Portugal	20	2004	Rhodes	Greece
9	1988	Paris	France	21	2006	Reykjavik	Iceland
10	1989	Belgrade	Yugoslavia	22	2007	Prague	Czech Republic
11	1991	Aachen	Germany	23	2009	Bonn	Germany
12	1992	Helsinki	Finland	24	2010	Lisbon	Portugal

KEYNOTE TALKS

Besides more than 2,000 presentations covering all areas of OR, keynote talks of world-class speakers will provide outstanding reviews and knowledge on their current research fields.

Experimental Results on the Process of Goal Formation and Aspiration Adaptation

Reinhard Selten (Nobel Prize in Economics 1994, University of Bonn)

Abstract: We experimentally investigate how subjects deal with a multi-period planning and decision problem. The context is a profit maximization task in a computer-simulated monopoly market over fifty time periods. Subjects have to form vectors of goal variables. A goal variable is an arithmetic expression involving short term feedback variables like profit, sales or quality. An aspiration level is a vector of numerical values for the goal variables. The subjects are provided with a computerized planning tool allowing them to check feasibility of any aspiration level. We present results regarding, first, the selection of goal variables and, second, the process of aspiration adaptation. As to the first, we find that goal persistence, a measure of a subject's tendency to stick to the current goal system, is strongly positively correlated with success. As to the second, we find that aspiration levels tend to be changed in strong agreement with basic principles of Aspiration Adaptation Theory (Sauermann and Selten 1962, Selten 1998, 2001). In addition, we find that in many cases the process of aspiration adaptation leads into a nearly stationary situation in which the aspiration level is approximately reproduced by a subject over several periods. Some subjects who reach a nearly stationary situation explore for a more profitable nearly stationary situation. Those subjects who reach a nearly stationary situation tend to be more successful and more goal persistent than those who do not. This is a joint work with Sabine Pittnauer and Martin Hohnisch.

Computing Equilibria

Christos Papadimitriou (IFORS distinguished lecturer, University of California at Berkeley)

Abstract: The existence theorems establishing that certain equilibria, such as the mixed Nash equilibrium and price equilibria, are guaranteed to exist under very general conditions, are some of the most reassuring results in Economics. Developing efficient algorithms for computing these equilibria – that is, rendering these existence theorems constructive – has been over the past decades an important research front, which however has met with very limited success. In recent years, a new kind of complexity theory has been developed and applied to establish that certain of these computational problems are intractable, thus explaining the lack of progress in the development of efficient algorithms for them. These complexity results raise important new questions related to efficient algorithm for computing approximate equilibria, not unlike the way in which the theory of NP-completeness for combinatorial optimization problems in the 1970s led researchers to the exploration of approximation algorithms. In this talk I shall survey these complexity results, as well as a few recent algorithmic advances.

Using Allocated Costs for Decision Making: Reconciling Theory with Practice

Ramji Balakrishnan (University of Iowa)

Abstract: Firms spend considerable resources in devising product costing systems. These systems divide up a firm's capacity costs (e.g., the cost of machinery and buildings) into pieces attributable to individual products and customers. Overwhelming evidence shows that managers worldwide use allocated costs for making product pricing and capacity planning decisions. For example, firms routinely drop product lines that do not recover their full (allocated) cost. Economists question this practice. They argue that the costs being allocated comprise of a firm's committed /sunk costs. Thus, these costs or their allocations are irrelevant from a decision making perspective. I aim to summarize recent research that seeks to reconcile theory with practice, and offer avenues for additional work. The core idea of this research stream is the notion that a firm's product- and capacity-planning problem is computationally complex. A conceptually correct formulation is multi-period stochastic optimization problem with complex linkages across periods (e.g. inventory) and constraints (e.g., multiple resources used by the same product). Accounting researchers argue that this problem is not solvable. They argue that product cost data can serve as economically sufficient statistics that permit problem decomposition. Such decomposition would permit managers to deal with pricing problems that pertain to individual products and planning problems that deal with each capacity resource. This research, which has many links to operations research, has examined questions under which such problem decomposition is costless and problem features that lead to a loss. Even when product cost is not economically optimal, it is reasonable to think of it as a heuristic that aids "local" decision making. This view raises the question of the magnitude of the economic loss from using heuristics, as well as methods for improving our estimation. In particular, it is of interest to examine the sources of error (e.g., model specification, aggregation and/or measurement) and their implications for the accuracy of product costs. Simulations play a significant role in this research stream that has considerable practical appeal. Finally, current research has begun to examine questions of how the robustness of problem solutions to the error in the estimates.

Assignment Problems

Rainer Burkard (EURO Gold Medal 1997, Graz University of Technology)

Abstract: Assignment problems (AP) are classical OR problems which occur in many applications. This lecture will not only outline recent results concerning the history of AP, but will also discuss novel applications, new findings concerning the probabilistic behaviour of AP and a framework for deriving bounds in a very general setting. Namely: New findings show that linear assignment problems can be traced back to the mathematics of the 19th century. Bob Machol stated that linear assignment problems have only very few genuine applications. We outline new applications related to the origin of our universe as well as to problems in geometry. In 1969 Donath conjectured the expected optimal value of a linear AP with random cost coefficients in [0,1]. More than 30 years later this conjecture has been verified by Aldous. Aldous' theorem gave the impulse for interesting new investigations on random AP. Finally we outline the concept of admissible transformations which allows to treat sum and bottleneck problems from a unified viewpoint. Many bounding schemes for quadratic and multi-index AP can be formulated within this framework.

New Cutting and Packing Methodologies and their Commercial Application

Edmund Burke (University of Nottingham)

Abstract: This talk will present an overview into research conducted by the Automated Scheduling, Optimisation and Planning Research group on cutting and packing methodologies. It will focus on advances that have been made by our team over recent years. First of all, it will address the non-guillotine variant of the rectangular packing problem. A heuristic method based on the methodology of best-fit will be presented. After this, the packing of irregular shapes will be discussed and new algorithms will be presented that maintain full accuracy with shapes that may contain lines, arcs and holes. In both the rectangular and irregular variants of the stock cutting problem, the presented algorithms produce significantly better results than the previous state of the art on a wide range of benchmarks from over 20 years of cutting and packing research. As a direct result of this work we have founded a spin-out company, Aptia Solutions Ltd, to further develop and commercialise these algorithms and the talk will conclude by discussing some of the commercial issues facing this research area.

Airport OR

Ulrich Dorndorf (INFORM GmbH, Aachen)

Abstract: Airports are increasingly seen as future bottlenecks of the air transport system. Airport and Aircraft Operators, Ground Handling companies and Air Traffic Service Providers are under pressure to improve operational efficiency, predictability and on-time performance. Airport Operations lead to a number of challenging optimisation problems. The goals are to enhance the use of ground handling resources, to optimise the use of airport infrastructure from runways and taxiways to apron and terminal resources such as stands, gates or check-in counters, to reduce ground movement costs, as well as to reduce Air Traffic Flow Management slot wastage. Problems arise at the planning and at online control level, where the task is complicated by frequent changes of the flight schedule. We give an overview of Airport OR applications and illustrate it by example problems for scheduling terminal and ground handling resources. We conclude with current trends in airport applications. Airport OR has traditionally been concerned with the optimisation of individual, local processes. Airports and airlines are beginning to set up Airport (Hub) Operations Control Centers to obtain an overall view of their operations, especially of the aircraft turn-around processes. Airport Collaborative Decision Making (A-CDM) takes this one step further by providing an integrated view of all processes from arrival and departure sequencing, surface movement to turn-around management. The Total Airport Management (TAM) concept extends A-CDM by including passenger processes on the landside.

The Dominance-based Rough Set Approach for Decision Analysis and Operations Research

Salvatore Greco (University of Catania)

Abstract: Rough set approach proposed by Pawlak at the beginning of eighties can be considered as a mathematical basis for reasoning about data. It has been applied in a large spectrum of domains, ranging from medicine to chemistry, and from biology to finance. Standard rough set theory is not able, however, to deal with ordinal data which are so important for decision problems where they represent preferences. On

KEYNOTE TALKS

the basis of this remark, Dominance-based Rough Set Approach (DRSA) has been proposed and developed since mid-nineties. It accepts preference information in the easy form of examples of decisions, and gives as output well understandable "if …, then …" decision rules, such as "if objective_1 reaches at least value alpha_1 and objective_2 reaches at least value alpha_2, then the considered solution is good". The simple input of decision examples and the comprehensible output in terms of decision rules makes of DRSA a decision support "glass box", which contrasts with many existing "black boxes". DRSA has also been successfully applied to decision under uncertainty and time preference. Moreover, DRSA has been integrated with interactive multiobjective optimization procedures, in particular, evolutionary procedures, that can be used to deal with hard operations research problems, like production planning, portfolio selection, scheduling, inventory management, and so on. We present basic ideas of DRSA with an emphasis on its applications in operations research.

Problem Solving by General Purpose Solvers

Toshihide Ibaraki (Kwansei Gakuin University)

Abstract: To solve problems abundant in real world applications, we have been proposing an approach of using general purpose solvers, since we cannot afford to prepare special purpose algorithms for all individual problems. For this, we developed general purpose solvers for several standard problems such as CSP (constraint satisfaction problem), RCPSP (resource constrained project scheduling problem) and VRP (vehicle routing problem), among others. Their algorithms are all based on metaheuristics which utilize local search as their cores. The solvers have been successfully applied to many applications. In this talk, we report some of our recent experiences, including those for ITC2007 (International Timetabling Competition) and other industrial applications.

Semi-Infinite Optimization

Hubertus Th. Jongen (RWTH Aachen University)

Abstract: Semi-infinite optimization problems (SIP) are problems in finite dimensions with an infinite number of inequality constraints. For example, the index set of inequality constraints might be an interval, a rectangle or a compact manifold with boundary. In case that the latter index set also depends on the state variable, SIP is called a general(ized) semi-infinite optimization problem (GSIP). The structure of GSIP is much more complicated. In this lecture we present a survey on structural results on SIP and GSIP.

2-Dimensional Packing Problems in Telecommunications

Andrea Lodi (University of Bologna)

Abstract: We consider 2-dimensional packing problems arising from telecommunications applications. In particular, according to WiMAX technology, information is sent to several users within the same frame, and an efficient and fast way to send information and to recover it is required. This leads to interesting 2-dimensional packing problems for which different objective functions can be defined. For a simplified version of the real-world problem we provide an approximation algorithm and different fast heuristics, which turn out to be effective in practice. Finally, computational experiments on a set of real-world instances are presented.

Routing in Graphs with Applications to Material Flow Problems

Rolf Möhring (University of Technology, Berlin)

Abstract: Material flow problems are complex logistic optimization problems. We want to utilize the available logistic network in such a way that the load is minimized or the throughput is maximized. This lecture deals with these optimization problems from the viewpoint of network flow theory and reports on two industrial applications: (1) contolling material flow with automated guided vehicles in a container terminal (cooperation with HHLA), and (2) timetabling in public transport (cooperation with Deutsche Bahn and Berlin Public Transport). The key ingredient for (1) is a very fast real-time algorithm which avoids collisions, deadlocks, and other conflicts already at route computation, while for (2) it is the use of integer programs based on special bases of the cycle space of the routing graph. References [1] E. Gawrilow, E. Köhler, R. H. Möhring, and B. Stenzel, Dynamic routing of automated guided vehicles in real-time, in Mathematics — Key Technology for the Future. Joint Projects between Universities and Industry 2004 -2007, W. Jäger and H.-J. Krebs, eds., Springer, 2008, pp. 165–178. [2] C. Liebchen and R. H. Möhring, The modeling power of the periodic event scheduling problem: Railway timetables - and beyond, in Algorithmic Methods for Railway Optimization, F. Geraets, L. Kroon, A. Schöbel, D. Wagner, and C. D. Zaroliagis, eds., vol. 4359 of Lecture Notes in Computer Science, Springer, Berlin/Heidelberg, 2007, pp. 3–40.

Google's auction for TV ads

Noam Nisan (Hebrew University)

Abstract: The talk will describe the auction system used by Google for allocation and pricing of TV ads. The auction is based on a simultaneous ascending auction, and has been in use since September 2008.

Conic programming relaxations for combinatorial optimization

Franz Rendl (University of Klagenfurt)

Abstract: The success of interior point methods in the 1990's to solve semidefinite programs (SDP) has spurred the interest in SDP as a modelling tool in various mathematical fields. In the context of combinatorial optimization, it turned out that SDP is particularly effective, if the underlying 0-1 formulation of the problem involves quadratic terms. In this talk, several SDP relaxations of NP-hard combinatorial optimization problems will be discussed. We also address relaxations based on the cone of completely positive matrices as a more recent tool. These relaxations can be used either theoretically, to get approximations with an a priori upper bound on the error. They can also be used computationally to solve the underlying problem to optimality. Some recent developments in both directions will be presented. These cover Max-Clique, Graph Coloring and other Graph partition problems. The resulting SDP are typically of sizes, not accessible by interior point methods. We therefore also discuss some very recent algorithmic developments to solve these relaxations.

ELECTRE Methods: Main Features and New Developments

Bernard Roy (EURO Gold Medal 1992, University Paris-Dauphine) and José Rui Figueira (Technical University of Lisbon)

Abstract: After a brief description of the constructivist conception in which ELECTRE method are inserted, we shall present the main features of theses methods. They include elements such as, the possibility of modeling by taking into account positive and negative reasons, without any recoding of data; thresholds used to take into account the imperfect knowledge of data; absence of systematic compensation between "gains" and "losses". The main weaknesses will also be presented. Then, some aspects related to new developments will be presented. They are related to new methodological tools, new procedures, axiomatic, and many other aspects. Finally, some concluding remarks will be outlined.

Prime Numbers and Circuits

Nitin Saxena (Goedel Prize 2006, Fulkerson Prize 2006, University of Bonn)

Abstract: Prime numbers are not only fundamental mathematical objects but also have real world applications in cryptography. But the question of efficiently distinguishing primes from the composites was fully resolved only in 2002. We will review this deterministic polynomial time primality test (colloquially called the AKS primality test). This solution relates to more general questions about circuits which we will briefly survey.

Sports Scheduling and Advances in Integer and Constraint Programming

Michael Trick (Carnegie Mellon University)

Abstract: Advances in sports scheduling methods are changing how professional and amateur schedules are created. Leagues around the world are using optimization and related approaches for their team and officials scheduling. I will give some experiences in scheduling real sports leagues and outline what I believe are the major trends in optimization that are making it easier to create high quality schedules. My experiences come from leagues that range from a local children's football (soccer) league to scheduling the 2430 games that make up a single year's schedule for the US Major League Baseball. Computational methods from ten years ago are insufficient to attack these problems, even on today's computers, but recent advances in integrating integer and constraint programming, large neighborhood local search, and variable redefinition create powerful, flexible solution methods.

Combinatorial Optimization in Chip Design

Jens Vygen (University of Bonn)

Abstract: Chip design is one of the most fascinating application areas of mathematics. The rapid technological development, exponentially growing instance sizes, and the computational complexity of the key problems are posing continuous challenges to research. In particular, recent advances in combinatorial optimization have lead to substantially improved algorithms used in industry, and hence to better chips. We give some examples of this most fruitful interaction between theory and application, illustrating the variety of problems and techniques. Topics include partitioning, routing, resource sharing, and facility location.

Optimal Control of Manufacturing Systems: Solution of Fluid Approximation and Tracking by Queueing Model

Gideon Weiss (University of Haifa)

Abstract: We consider the optimal control of a large manufacturing system, over a finite time horizon, e.g. a semiconductor wafer fabrication plant. We model this as a multi-class queueing network. We approximate the queueing network by a fluid network, and obtain an optimal fluid solution by solving a separated continuous linear program (SCLP). To track this fluid solution we model the deviations of the real system from the fluid solution by a multi-class queueing network with infinite virtual queues (IVQ). By keeping these deviations stable we obtain an asymptotically optimal control policy. We shall explain our motivation and the main features of this approach. We will then introduce the two themes of which it is based: A novel simplex like algorithm for the solution of SCLP, and the modeling device of IVQs. While this talk combines ideas from Manufacturing, Optimization and Queueing, it will be accessible to a wide audience of EURO members.

LIST OF MAIN STREAMS

Continuous Optimization and Control
Tamas Terlaky, (terlaky@lehigh.edu)
Gerhard-Wilhelm Weber, (gweber@metu.edu.tr)

Data mining, Knowledge Discovery, Artificial Intelligence
Uwe Aickelin, (uwe.aickelin@nottingham.ac.uk)
Raymond Bisdorff, (raymond.bisdorff@uni.lu)
Philippe Lenca, (Philippe.Lenca@telecom-bretagne.eu)
Roman Słowiński, (roman.slowinski@cs.put.poznan.pl)

DEA and Performance Management
Robert Dyson, (Robert.Dyson@wbs.ac.uk)
Meryem Duygun Fethi, (m.fethi@le.ac.uk)
Emmanuel Thanassoulis, (e.thanassoulis@aston.ac.uk)

Decision Analysis, Decision Support Systems, Modelling Languages
Per Agrell, (agrell@core.ucl.ac.be),
Pascal van Hentenryk, (pvh@cs.brown.edu)
Pascale Zarate, (zarate@irit.fr)

Discrete Optimization, Graphs & Networks
Endre Boros, (boros@rutcor.rutgers.edu)
Silvano Martello, (silvano.martello@unibo.it)
José Oliveira, (jose.oliveira@fe.up.pt)
Paolo Toth, (ptoth@deis.unibo.it)

Energy, Environment & Climate
Carlos Henggeler Antunes, (cantunes@inescc.pt)
Peter Letmathe, (peter.letmathe@uni-siegen.de)
Hans-Jakob Luethi, (hans-jakob.luethi@ifor.math.ethz.ch)

Financial Modelling, Risk Management, Banking
Thomas Burkhardt, (tburkha@uni-koblenz.de)
Antti S. Korhonen, (asko@hut.fi)
Hans-Jakob Luethi, (hans-jakob.luethi@ifor.math.ethz.ch)
Jaap Spronk, (jspronk@rsm.nl)
Constantin Zopounidis, (kostas@dpem.tuc.gr)

Fuzzy Sets, Softcomputing
Heinrich Rommelfanger, (rommelfanger@wiwi.uni-frankfurt.de)
Hans-Georg Zimmermann, (Hans_Georg.Zimmermann@siemens.com)
Bernard de Baets, (Bernard.DeBaets@ugent.be)
Janos Fodor, (fodor@bmf.hu)

Game Theory, Mathematical & Experimental Economics
Ulrike Leopold, (ulrike.leopold@uni-graz.at)
Stefan Pickl, (stefan.pickl@unibw.de)

Health, Life Sciences & Bioinformatics
Jacek Błażewicz, (jblazewicz@cs.put.poznan.pl)
Dorien DeTombe, (DeTombe@nosmo.nl)
Jonathan Garibaldi, (jmg@cs.nott.ac.uk)
Stefan Nickel, (s.nickel@orl.uni-saarland.de
Jan Vissers, (vissers@bmg.eur.nl)

Location, Logistics, Transportation, Traffic
Cynthia Barnhart, (cbarnhar@mit.edu)
Maurizio Bielli, (bielli@iasi.rm.cnr.it)
Teodor Gabriel Crainic, (theo@crt.umontreal.ca)
Dirk C. Mattfeld, (d.mattfeld@tu-bs.de)
Frank Plastria, (Frank.Plastria@vub.ac.be)
Maria Grazia Speranza, (speranza@eco.unibs.it)

Metaheuristics & Biologically Inspired Approaches
Michel Gendreau, (michelg@crt.umontreal.ca)
Graham Kendall, (gxk@cs.nott.ac.uk)
Marc Sevaux, (marc.sevaux@univ-ubs.fr)
Kenneth Sorensen, (kenneth.sorensen@ua.ac.be)
Jacques Teghem, (jacques.teghem@fpms.ac.be)
Stefan Voss, (stefan.voss@uni-hamburg.de)

Multiple Criteria Decision Making, Optimization & Group Decision
Roman Słowiński, (roman.slowinski@cs.put.poznan.pl)
Salvatore Greco, (salgreco@unict.it)
José Figueira, (figueira@ist.utl.pt)

OR Education, History & Ethics
Jean-Pierre Brans, (jpbrans@vub.ac.be)
Fred Wenstop, (fred.wenstop@bi.no)
Maurice Shutler, (maurice.shutler@tiscali.co.uk)
Heiner Mueller-Merbach, (hmm@bior.de)

OR for Development and Developing Countries
Gerhard-Wilhelm Weber, (gweber@metu.edu.tr)

OR in Agriculture, Forestry & Natural Resources
Manfred Gronalt, (manfred.gronalt@boku.ac.at)
Peter Lohmander, (peter.lohmander@sekon.slu.se)
Lluis Pla-Aragones, (lmpla@matematica.udl.es)
Andres Weintraub, (aweintra@dii.uchile.cl)

OR in Industries & Software Applications
Wim Nuijten, (nuijten@ilog.fr)
Jo van Nunnen, (jnunen@rsm.nl)
Erwin Pesch, (erwin.pesch@uni-siegen.de)
Martin Savelsbergh, (martin.savelsbergh@isye.gatech.edu)

Production Management, Supply Chain Management
Rommert Dekker, (rdekker@few.eur.nl)
Moritz Fleischmann, (mfleischmann@rsm.-nl)
Herbert Meyr, (meyr@bwl.tu-darmstadt.de)
Michael Pinedo, (mpinedo@stern.nyu.edu)

Revenue Management & Managerial Accounting
Jan Bouwens, (J.Bouwens@uvt.nl)
Christian Hofmann, (Christian.Hofmann@bwl.uni-mannheim.de)
Alf Kimms, (alf.kimms@uni-duisburg-essen.de)
Peter Letmathe, (peter.letmathe@uni-siegen.de)
Kalyan Talluri, (kalyan.talluri@upf.edu)

Scheduling, Time Tabling & Project Management
Erik Demeulemeester, (Erik.Demeulemeester@econ.kuleuven.be)
Graham Kendall, (gxk@cs.nott.ac.uk)
Sanja Petrovic, (sxp@cs.nott.ac.uk)
Ruben Ruiz Garcia, (rruiz@eio.upv.com)
Jan Węglarz, (jan.weglarz@cs.put.poznan.pl)

Stochastic Programming, Stochastic Modelling, Simulation
Ger Koole, (koole@few.vu.nl)
Mike Pidd, (M.Pidd@lancaster.ac.uk)
Andras Prekopa, (prekopa@rutcor.rutgers.edu)
Ruediger Schultz, (schultz@math.uni-duisburg.de)

System Dynamics, Dynamic Modelling
Gustav Feichtinger, (or@eos.tuwien.ac.at)
Pierre Kunsch, (pikunsch@ulb.ac.be)

Telecommunication & Network Analysis
Edoardo Amaldi, (amaldi@elet.polimi.it)
Sem Borst, (s.c.borst@tue.nl)
Bernard Fortz, (Bernard.Fortz@ulb.ac.be)
Luis Gouveia, (legouveia@fc.ul.pt)

LIST OF ACCEPTED STREAMS

Agent-Based Modelling
Massimo Genoese, (massimo.genoese@kit.edu)
Analytic Hierarchy Processes, Analytic Network Processes
Josef Jablonsky, (jablon@vse.cz)
Y. Ilker Topcu, (yitopcu@fenerbahce.com.tr)
Application of Fuzzy Logic & Real Options to Corporate Management and Decision-Making
Mikael Collan, (mcollan@abo.fi)
Applications in Business Intelligence and Knowledge Discovery
Richard Weber, (rweber@dii.uchile.cl)
Boolean Programming
Endre Boros, (Endre.Boros@rutcor.rutgers.edu)
Combinatorial Optimization
Silvano Martello, (silvano.martello@unibo.it)
Complexity and Optimization
Klaus Meer, (meer@informatik.tu-cottbus.de)
Computational Biology, Bioinformatics and Medicine
Jacek Błażewicz, (jblazewicz@cs.put.poznan.pl)
Metin Türkay, (mturkay@ku.edu.tr)
Jon Garibaldi, (jmg@Cs.Nott.AC.UK)
Computational Statistics
Pakize Taylan, (ptaylan@metu.edu.tr)
Container Terminal Operations
Iris Vis, (ivis@feweb.vu.nl)
Christian Bierwirth, (bierwirth@wiwi.uni-halle.de)
Convex Optimization 1
Aharon Ben-Tal, (abental@ie.technion.ac.il)
Amir Beck, (becka@ie.technion.ac.il)
Marc Teboulle, (teboulle@post.tau.ac.il)
Convex Optimization 2
Angelia Nedich, (angelia@uiuc.edu)
Asu Ozdaglar, (asuman@mit.edu)
Cooperative Game Theory
Mariana Rodica Branzei, (branzeir@info.uaic.ro)
S. Zeynep Alparslan-Gök, (alzeynep@metu.edu.tr)
Cutting and Packing
José F. Oliveira, (jfo@fe.up.pt)
Data Mining and Decision Making
Hsin-Vonn (Yvonne) Seow, (Hsin-Vonn.Seow@nottingham.edu.my)
Data Mining and Knowledge Discovery
Yiannis Theodoridis, (ytheod@unipi.gr)
Nikos Pelekis, (npelekis@unipi.gr)
Data Mining in Quality Improvement
Gülser Köksal, (koksal@ie.metu.edu.tr)
DEA and Performance Measurement
Ozren Despic, (ozren.despic@ntlworld.com)
Dimitris K. Despotis, (despotis@unipi.gr)
Decision Support Systems
Pascale Zarate, (Pascale.Zarate@ensiacet.fr)
Fatima Dargam, (F.Dargam@SimTechnology.com)
Delegation and Incentives
Peter Letmathe, (peter.letmathe@uni-siegen.de)
Christian Hofmann, (Christian.Hofmann@bwl.uni-mannheim.de)
Demand and Supply in Consumer Goods and Retailing
Heinrich Kuhn, (heinrich.kuhn@ku-eichstaett.de)
Winfried Steiner, (winfried.steiner@tu-clausthal.de)
Waldemar Toporowski, (wtoporo@uni-goettingen.de)
Demand, Pricing and Revenue Management
Alf Kimms, (alf.kimms@uni-duisburg-essen.de)
Robert Klein, (robert.klein@wiwi.uni-augsburg.de)
Discrete and Global Optimization
Xiaoling Sun, (xls@fudan.edu.cn)
Discrete Optimal Control
Dimitrii Lozovanu, (lozovanu@math.md)
Gerhard-Wilhelm Weber, (gweber@metu.edu.tr)
Dynamic Programming
Lidija Zadnik-Stirn, (lidija.zadnik@bf.uni-lj.si)
Moshe Sniedovich, (m.sniedovich@ms.unimelb.edu.au)
Dynamical Systems and Game Theory
Alberto Pinto, (aapinto1@gmail.com)
Economic Lot Scheduling Problem
Anders Segerstedt, (Anders.Segerstedt@ltu.se)
Energy and Emission Markets
Hans Jakob Luethi, (luethi@ifor.math.ethz.ch)
Stefan W. Pickl, (stefan.pickl@unibw.de)
Engineering Optimization
José Herskovits Norman, (jose@optimize.ufrj.br)
Environmental Analysis and Applications
Costas Pappis, (pappis@unipi.gr)
Evolutionary Multi Objective Optimization
Jürgen Branke, (jbr@aifb.uni-karlsruhe.de)
Experimental Economics and Game Theory
Ulrike Leopold-Wildburger, (ulrike.leopold@uni-graz.at)
Stefan W. Pickl, (spickl@informatik.unibw-muenchen.de)
Facilitated Decision Modelling
Alberto Franco, (Alberto.Franco@wbs.ac.uk)
Gilberto Montibeller, (G.Montibeller@lse.ac.uk)
Facility Logistics
John Bartholdi, (john.bartholdi@isye.gatech.edu)
Financial Modeling
Georg Pflug, (georg.pflug@univie.ac.at)
Rita L. D'Ecclesia, (rita.decclesia@uniroma1.it)
Ronald Hochreiter, (ronald.hochreiter@univie.ac.at)
Financial Optimization
Gautam Mitra, (Gautam.Mitra@brunel.ac.uk)
John Beasley, (John.Beasley@brunel.ac.uk)
Fuzzy Optimization
Jaroslav Ramík, (ramik@opf.slu.cz)
Fuzzy Systems, Neural Networks & Artificial Intelligence
Heinrich Rommelfanger, (rommelfanger@wiwi.uni-frankfurt.de)
Georg Zimmermann, (Hans_Georg.Zimmermann@siemens.com)
Geometric Clustering
Andreas Brieden, (andreas.brieden@unibw.de)
Peter Gritzmann, (gritzman@ma.tum.de)
Global Optimization
Janos D. Pinter, (jdpinter@hfx.eastlink.ca)
Eligius Hendrix, (Eligius.Hendrix@wur.nl)
Graph Searching
Oznur Yasar, (oznur@math.mun.ca)
Danny Dyer, (dyer@math.mun.ca)
Boting Yang, (boting@cs.uregina.ca)
Graphs and Networks
Dominique de Werra, (dewerra@gmail.com)
Health Care Management
Marion Rauner, (marion.rauner@univie.ac.at)
Stefan Nickel, (s.nickel@orl.uni-saarland.de)
Teresa Melo, (melo@itwm.fhg.de)
Jan M.H. Vissers, (j.m.h.vissers@erasmusmc.nl
Ill-posed Variational Problems - Theory, Methods and Applications
Rainer Tichatschke, (tichat@uni-trier.de)
Alexander Ioffe, (ioffe@tx.technion.ac.il)
Özlem Birgül, (obirgul@gmail.com)
Xiaoqi Yang, (mayangxq@polyu.edu.hk)
Inventory Management
Stefan Minner, (stefan.minner@univie.ac.at)
Knowledge Discovery and Data Mining
Uwe Aickelin, (uwe.aickelin@nottingham.ac.uk)
Luis Cavique, (lcavique@gmail.com)
Knowledge Discovery for Decision Support
Raymond Bisdorff, (raymond.bisdorff@uni.lu)
Philippe Lenca, (Philippe.Lenca@telecom-bretagne.eu)
Lean Accounting
Francis Kennedy, (FKENNED@exchange.clemson.edu)
Location Analysis
Frank Plastria, (Frank.Plastria@vub.ac.be)
Long Term Financial Decisions
Thomas Burkhardt, (tburkha@uni-koblenz.de)
Machine Learning and Its Applications
Kristiaan Pelckmans, (Kristiaan.Pelckmans@esat.kuleuven.be)
Jacob Kogan, (kogan@math.umbc.edu)
Süreyya Özögür-Akyüz, (sozogur@metu.edu.tr)
Mathematical Models in Macroeconomics
Claus Neidhardt, (neidhardt@rheinahrcampus.de)
Jürgen Kraemer, (kremer@rheinahrcampus.de)
Mathematical Programming
Gerhard-Wilhelm Weber, (gweber@metu.edu.tr)
Karel Zimmermann, (Zimmermann@seznam.cz)
Tamas Terlaky, (terlaky@lehigh.edu)
Imre Polik, (imre.polik@gmail.com)
Alexander Martin, (martin@mathematik.tu-darmstadt.de)
Metaheuristics
Kenneth Sorensen, (kenneth.sorensen@ua.ac.be)
Marc Sevaux, (marc.sevaux@univ-ubs.fr)
Andreas Reinholz, (andreas.reinholz@uni-dortmund.de)
Methodology of Societal Complexity
Dorien J. DeTombe, (detombe@nosmo.nl)
Migration, Education and Sustainable Development
Hanife Akar, (hanif@metu.edu.tr)
Mining
Alexandra Newman, (anewman@mines.edu)

LIST OF ACCEPTED STREAMS

Modern Developments in Physics: Emergence, Mind, Living and Computation
Ignazio Licata, (ignazio.licata@ejtp.info)
Burak Yedierler, (buraky@metu.edu.tr)

Multi Objective Optimization and Decision Theory 1
José Figueira, (figueira@ist.utl.pt)
Kathrin Klamroth, (klamroth@math.uni-wuppertal.de)

Multi Objective Optimization and Decision Theory 2
Jutta Geldermann, (geldermann@wiwi.uni-goettingen.de)
Christiane Tammer , (christiane.tammer@mathematik.uni-halle.de)

Multiple Criteria Decision Analysis
José Figueira, (figueira@ist.utl.pt)
Salvatore Greco, (salgreco@unict.it)

Network Optimization
Bernard Fortz, (bernard.fortz@ulb.ac.be)
Luis Gouveia, (legouveia@fc.ul.pt)

Nonconvex Programming: Local and Global Approaches - Theory, Algorithms and Applications
Pham Dinh Tao, (pham@insa-rouen.fr)
Le Thi Hoai An, (lethi@sciences.univ-metz.fr)

Noncooperative Games
Ignacio Garcia Jurado, (igjurado@usc.es)

Nonlinear Programming
E. Alper Yildirim, (yildirim@bilkent.edu.tr)
Tatiana Tchemisova, (tatiana@mat.ua.pt)
Olga Kostyukova, (kostyukova@im.bas-net.by)

Nonsmooth Optimization and its Applications
Adil Bagirov, (a.bagirov@ballarat.edu.au)
Antonio Fuduli, (antonio.fuduli@unical.it)
Refail Kasimbeyli, (refail.kasimbeyli@ieu.edu.tr)

Numerical Methods in Finance
Ömür Ugur, (ougur@metu.edu.tr)

Operational Research and Quantitative Models in Banking
Constantin Zopounidis, (kostas@dpem.tuc.gr)

Optimal Control
Erik Kropat, (Erik.Kropat@am.uni-erlangen.de)
Gustav Feichtinger, (or@eos.tuwien.ac.at)
Gerhard-Wilhelm Weber, (gweber@metu.edu.tr)

Optimal Control in Finance and Insurance
Ulrich Rieder, (ulrich.rieder@uni-ulm.de)
Nicole Baeuerle, (baeuerle@stoch.uni-karlsruhe.de)

Optimization and Data Mining
Emilio Carrizosa, (ecarrizosa@us.es)
Theodore Trafalis, (ttrafalis@ou.edu)
Renato De Leone, (renato.deleone@unicam.it)

Optimization in Public Transport
Leo Kroon, (lkroon@rsm.nl)
Anita Schöbel, (schoebel@math.uni-goettingen.de)

OR and Environmental Management
Peter Letmathe, (peter.letmathe@uni-siegen.de)
Axel Tuma, (axel.tuma@wiwi.uni-augsburg.de)

OR and Ethics
Fred Wenstøp, (fred.wenstop@bi.no)

OR and Real Implementations
Ben Lev, (blev@umich.edu)
Belarmino Adenso-Diaz, (ADENSO@epsig.uniovi.es)

OR Applications in Industry
Josef Kallrath, (josef.kallrath@web.de)
Bjarni Kristjansson, (bjarni@maximalsoftware.com)
Eleni Pratsini, (pra@zurich.ibm.com)

OR for Development
Leroy White, (Leroy.White@bristol.ac.uk)
Gerhard-Wilhelm Weber, (gweber@metu.edu.tr)
Marthie Harmse, (marthi.harmse@sasol.com)
Honora Smith, (Honora.Smith@soton.ac.uk)

OR in Agriculture and Forest Management
Lluis Miquel Pla Aragones, (lmpla@matematica.udl.es)
Manfred Gronalt, (manfred.gronalt@boku.ac.at)

OR in Mathematics Education
Seren Basaran, (sbasaran@ii.metu.edu.tr)

OR in Sports
Michael Trick, (trick@cmu.edu)
Dirk Briskorn, (briskorn@bwl.uni-kiel.de)

Parametric Optimization
Georg J. Still, (g.still@math.utwente.nl)
Jürgen Guddat, (guddat@mathematik.hu-berlin.de)

PDE Constrained Optimization
Bülent Karasözen, (bulent@metu.edu.tr)
Ronald W. Hoppe, (rohop@math.uh.edu)

Preference Learning from Data
Roman Słowiński, (roman.slowinski@cs.put.poznan.pl)

Project Management and Scheduling
Rainer Kolisch, (rainer.kolisch@wi.tum.de)
Christoph Schwindt, (christoph.schwindt@tu-clausthal.de)

Revenue Management
Houyuan Jiang, (h.jiang@jbs.cam.ac.uk)
Ayse Kocabiyikoglu, (aysekoca@bilkent.edu.tr)

Scheduling
Peter Brucker, (pbrucker@uni-osnabrueck.de)

Scheduling under Resource Constraints
Joanna Jozefowska, (joanna.jozefowska@put.poznan.pl)
Jan Węglarz, (Jan.Weglarz@cs.put.poznan.pl)

SD modelling in sustainable development
Pierre Kunsch, (pkunsch@vub.ac.be)
Erik Pruyt, (E.Pruyt@tudelft.nl)

Semi-Infinite Optimization
Jan-J. Rückmann, (ruckmanj@for.mat.bham.ac.uk)
Oliver Stein, (stein@wior.uni-karlsruhe.de)
Marco A. Lopez-Cerda, (marco.antonio@ua.es)
Miguel Goberna, (mgoberna@ua.es)
Maxim Todorov, (maxim.todorov@udlap.mx)

Simulation Applications in Private and Public Sectors
Banu Yuksel Ozkaya, (byuksel@hacettepe.edu.tr)
Murat Caner Testik, (mtestik@hacettepe.edu.tr)

Simulation Based Decision Support
Miroljub Kljajic, (miroljub.kljajic@fov.uni-mb.si)
Stig C. Holmberg, (shbg@ieee.org)

Simulation, Metamodeling and Optimization
Inci Batmaz, (ibatmaz@metu.edu.tr)

Software for OR/MS
Robert Fourer, (4er@iems.northwestern.edu)
Bjarni Kristjansson, (bjarni@maximalsoftware.com)

Stochastic Modelling and Simulation
Andreas Rössler, (roessler@mathematik.tu-darmstadt.de)
Erik Kropat, (kropat@am2.am.uni-erlangen.de)
Kuo-Hsiung Wang, (khwang@amath.nchu.edu.tw)

Stochastic Models for Service Operations
Ger M. Koole, (koole@few.vu.nl)
Sandjai Bhulai, (sbhulai@few.vu.nl)
Raik Stolletz, (raik.stolletz@prod.uni-hannover.de)

Stochastic Programming
Jitka Dupacová, (dupacova@karlin.mff.cuni.cz)
Werner Römisch, (romisch@math.hu-berlin.de)
Alexander Shapiro, (ashapiro@isye.gatech.edu)
Rüdiger Schultz, (schultz@math.uni-duisburg.de)

Supply Chain Planning
Herbert Meyr, (meyr@bwl.tu-darmstadt.de)
Moritz Fleischmann, (MFleischmann@rsm.nl)

Sustainable living: Cognitive, Social, Economical, Ecological and World View
Ali Gökmen, (agokmen@metu.edu.tr)
Inci Gökmen, (igokmen@metu.edu.tr)
Annette Hohenberger, (hohenberger@ii.metu.edu.tr)
Gerhard-Wilhelm Weber, (gweber@metu.edu.tr)

System Dynamics Modelling
Markus Schwaninger, (Markus.Schwaninger@unisg.ch)
Stefan Groesser, (Stefan.groesser@unisg.ch)

Timetabling and Rostering
Dario Landa-Silva, (jds@Cs.Nott.AC.UK)

Transportation
Maurizio Bielli, (bielli@iasi.cnr.it)

Transportation Planning
Herbert Kopfer, (kopfer@uni-bremen.de)
Frank Schultmann, (frank.schultmann@uni-siegen.de)

Uncertainty and Environmental Decision Making
Jerzy Filar, (Jerzy.Filar@unisa.edu.au)
Alain Haurie, (alain.haurie@hec.unige.ch)

Value and Risk in Incomplete Markets
Martin Rainer, (martin.rainer@enamec.de)

Variational Inequalities and Bi-Level Problems
Stephan Dempe, (dempe@tu-freiberg.de)
Christian Kanzow, (kanzow@mathematik.uni-wuerzburg.de)

Vector and Set-Valued Optimization
Vicente Novo, (vnovo@ind.uned.es)
Bienvenido Jimenez, (bjimenez@ind.uned.es)
Cesar Gutierrez, (cesargv@mat.uva.es)

Vehicle Routing
Paolo Toth, (ptoth@deis.unibo.it)

Young People for System Theory, Optimization and Education
Alexis Pasichny, (alexis.pasichny@gmail.com)
Kate Pereverza, (pereverza.kate@gmail.com)
Iryna Zbrutska, (iryna.zbrutska@gmail.com)
Alexander Makarenko, (makalex@mmsa.ntu-kpi.kiev.ua)