

EURO Bulletin

Bulletin of the Association of European Operational Research Societies (EURO) distributed 4 times a year (Spring, Summer, Fall, Winter) through the National Societies. Societies or individual members having news for the EURO Bulletin are requested to send their information to the editor: Ph. Van Asbroeck, 108 av. Slegelx, B-1030 Brussels, Belgium (tel. & fax.: +32 2 245 60 69).

from Professor Mike Pidd

Teaching OR/MS to MBA Students

Editor's Note

Professor Pidd has kindly contributed this article in the context of the EURO initiative led by Vice-President Costas Pappis, to publish a handbook on OR/MS educational programmes in Europe leading to M.Sc, MBA and Ph.D degrees.

Background

Recent years have seen explosive growth in the number of MBA programmes offered by British Universities. Invented in the USA and brought to the UK by London and Manchester Business Schools, MBA programmes can be found in most

British Universities. Their spread in the rest of the EC has been much slower, with notable exceptions such as INSEAD and IMEDE.

Most MBA programmes attempt to provide a broad coverage of business management topics and may allow students some opportunity for limited specialisation. There are also «specialist» MBAs which are increasing in number. Whether possession of an MBA will ever be as important in the EC as it is in the USA is a moot point. The fact is, however, that thousands of students take an MBA each year - especially in the UK.

To be successful in practice, OR/MS analysts and consultants need clients and sponsors who are knowledgeable and sympathetic. Many such clients will have completed MBA programmes and it is clearly important that any introduction to OR/MS on MBA courses is well conceived and well delivered. Realising this, the UK OR Society set up a meeting to discuss possible ways of ensuring that OR/MS is well taught on MBA programmes. This meeting, organised by Paul Thornton (past President of the OR Society) led to the creation of a small group, of which I am convenor.

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Teaching OR/MS to MBA Students (continued)

Hard or soft?

Informal soundings suggest that OR/MS is often taught as a disconnected set of mathematical and statistical techniques, sometimes under the banner of '«Quantitative Methods»'. In some cases, the methods taught are very simple and encourage the view that OR/MS is unsuitable for anything which is really important. The opposite risk is of teaching complicated methods to students who have never wished to take much mathematics.

The group did not wish to argue which of hard or soft OR/MS methods was superior, starting instead from the viewpoint that both have their place. However, it was concerned that, in many MBA programmes, OR/MS methods were seen just as mathematical methods which are only suitable for low-level, tactical problems. It was therefore concerned to raise the profile of OR/MS as an approach which made sense of certain techniques, rather than just as a set of techniques.

Appreciated by the students?

Amongst the group there seemed to be a view that OR/MS, as often taught, was unpopular with MBA students and that this might add to the forces which could reduce the OR/MS component of MBA pro-

grams. In trying to give an overall coverage of business management, MBA programmes have taken on an ambitious task, even more so in the UK where most fulltime programmes take 12 months. Hence there is a constant need for each element of an MBA syllabus to demonstrate that it justifies its space on the timetable.

There seemed to be three possible reasons why OR/MS is not always popular with MBA students. Firstly, the students themselves may have an inadequate background in maths and statistics to appreciate some of the methods when they are taught as if to OR/MS specialists. Secondly, as mentioned earlier, the methods may be taught in a heavily diluted form and this may convince the students that these methods are of no practical value. Thirdly, they may be taught by staff who have no practical experience of their use in organisations. All this could lead to students getting a rather miserable picture of the potential of OR/MS methods.

It has to be said, of course, that there are excellent teachers of OR/MS who convey their enthusiasm to MBA students and who deliver their material in a thoughtful way. There is also a recognition that learning is more important than teaching; that is, the role of the teacher is to encourage the student to learn. The idea of this group is to find ways which might help to raise general standards towards this excellence.

Teaching OR/MS (cont.)

A proposal

From this background, the OR Society group suggested that a sensible approach to improving OR/MS teaching and learning on MBA programmes might be as follows.

(1). Most MBA programmes already have a set of core courses which are taken by all students. There should be an OR/MS module within such a core which should aim to cover the following.

- A introductory course in statistics and spreadsheet modelling for those students who need it. This need not be called OR/MS.

- An OR/MS core course which presents a basic framework for OR/MS so as to demonstrate the value of rigour in decision making and to show how this can be achieved by problem structuring which may lead to the use of quantitative techniques.

(2). There should also be an attempt to develop cases and approaches which could form part of other courses taught on an MBA programme. For example, there are useful OR/MS methods and examples of their applications in Strategic Management, Marketing and Operations Management. The idea would be to develop teaching and learning material which would be used in courses carrying those labels and which directly relates to the OR/MS framework taught in the core.

(3). Given that most UK-based MBA programmes conclude with a project which is often a consulting style exercise, it might be sensible for a third prong to be an integrating course which would be available immediately prior to the start of the project. The idea would be to encourage a rigorous approach to projects.

Help needed

I would be very interested to receive comments on the scheme which is outlined above. Perhaps people might be willing to share their own experiences if they have attempted to follow such an approach. They may wish to criticise the approach, or even to offer an improved alternative. Others may have case studies which are suitable for MBA students and one of the subject courses. Whatever peoples views or ideas I would be delighted to hear from them.

I can be reached as follows:

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Mike Pidd

from EURO Vice-President Professor Costas Pappis

OR Teaching in MBA Courses in Euro Members Countries

The place of OR in MBA courses has been the focus of discussions in academia as well as in OR societies. The changes in the place of OR in such courses, the content and direction of OR teaching and ways for making it more relevant to manager's problems have been the issues of relevant discussions.

Professor Shutler, President of EURO, addressed this question in an article in the March issue of the EURO Bulletin and invited EURO member societies to send their views and information on the subject. Actually, he opened the discussion by reporting on the place of OR in MBA courses in the United Kingdom.

In response to Professor Shutler's invitation, information was sent from a number of Societies, summarized in the sequel.

United Kingdom

In particular, Professor Shutler reported on a discussion within the British OR society that took place because of a perception of world wide changes in the teaching of MBAs. By concentrating more on decision making by groups and on team work, the teaching of MBAs threat-

ened to reduce the core quantitative content of the courses traditionally provided by OR. It was agreed in this discussion that traditional OR courses were not appropriate for most of them. OR should be introduced as a "common front end", which would emphasize the role of models; demonstrate cases which presented an infusion of OR concepts into management, especially in functional areas such as marketing, distribution; and attempt to clarify the role of OR both in its concern with management as a general process for the allocation of physical and human resources and in its concern for the better motivation of these human resources to meet the needs of customers and shareholders alike .

The Netherlands

No trend such as the one experienced in the UK, is noticed in the Netherlands. As Professor Telgen, NSOR President, reports, in the Dutch practice OR used to be introduced as a bundle of quantitative techniques apt to solve any problem that fitted the techniques. Even in MBA programmes, OR was usually taught by mathematicians lacking any business experience. This led to distorted view of OR by future managers and a degradation of OR in business. Major

OR teaching & EURO

Dutch companies have dissolved their OR department or put them outside the company. Other OR groups have become subgroups of the computer services department. However, now another trend is seen in the Netherlands. Coinciding with the new business plan for the Dutch OR Society, and the ensuing discussions, changes in the educational system are taking place. Typical Operations Management programmes get infused with OR people and their modelling approach. Interest in (multi-criteria) group decision making is on the rise. And some new appointments of practice-hardened professors have been made. The result is a gradual shift in the teaching of OR with more emphasis on problem identification, problem structuring and modelling and less on mathematical details.

Germany

The present situation in Germany, as described by Professor Muller-Merbach, seems also quite different than that in the UK. In Germany, to some extent, OR/MS is fully integrated into parts of the education in Betriebswirtschaftlehre (equivalent to Business studies): LP models are found in production, in finance, in investment strategy etc. while simulation, combinatorial optimization etc. are integrated into the theory of the single functions of the enterprise. At the same time, however, there seems to be reduced emphasis on isolated OR/MS lectures in courses on Busi-

ness Studies. On the other hand, the lectures in OR/MS gradually turned more or less into mathematics lectures, and the old virtues of OR/MS, i.e., interdisciplinarity and the systems approach, are widely neglected.

Similar remarks concerning Germany are made by Professor Schneewei, who notes that OR in functional areas like financing, marketing and taxation is, if at all, absorbed in these fields. OR as a technique is still taught at business faculties, however the number of students is decreasing. The reason seems to be that OR is strongly linked with production and operations management, which is mainly taught in engineering faculties. Hence interested students do no longer study at business schools but at technical universities. OR is also taught within courses of business informatics which also absorbs students who might have genuinely been interested in OR and business administration. For business informatics, however, OR appears only to be an appendix of informatics.

Poland

Professor Slowinski, reporting on the situation in Poland, says that OR is well placed in MBA courses at Economic Faculties and in some Engineering courses at Technical Faculties, which give a particularly fertile ground for development of OR as a discipline. It comes from a close connection of OR with Computer Science and new technologies. This connection results in the development of complex models of decision problems

OR Teaching in MBA Courses in EURO Members Countries (continued)

and methods for solving them that take advantage of new informatic tools and technologies. So the courses including OR stimulating their most dynamic growth are courses of Computing or Computer Science and Organization and Management at Technical Universities in Poland.

Iceland

In Iceland there is no MBA education, as Professor Olafsson, President of the Icelandic OR Society, reports. In one case (a four year course in a Business Administration Department), one course in OR and another on production planning are taught, both on the third year. One course is also given on the fourth year for the few students that are product oriented, on production models. There is some skepticism regarding what and how is taught. Thus, while four years ago the simplex method and the dual problem was covered in the "standard way", now the students are not taught how the simplex method works mathematically, nor what the dual problem is. Instead, a lot of time is spent on modelling. The students have to solve LP problems on a PC and understand the results, e.g. dual prices and ranges for the RHS. The last two years 2-3 weeks (of 13) have been spent on Problem Structuring Methods, Strategic Choice Approach and Cognitive Maps which may be increased to four weeks.

Greece

In Greece, OR/MS is taught mostly in engineering faculties. There are no formal MBA courses in such faculties, however the engineering courses last 5 years, therefore they incorporate what would be considered a postgraduate part in the course. OR/MS is taught in separate lectures, including subjects such as LP, network analysis, queuing theory etc., and also incorporated in lectures on Operations Management. OR/MS appears also in the syllabus of other faculties (computer science, economics and mathematics departments), where it is taught in separate lectures or incorporated in courses on functional aspects of the enterprise.

The existence of a variety of models of placing OR in MBA in Europe is apparent from the above. Information from other European countries on this subject would be very welcome, as it would help complete the picture. The publishing of a handbook on OR/MS educational programmes in Europe would also be of considerable value. This is one of the tasks which currently appear in the agenda of the EURO Executive Committee.

Costas Pappis
Associate Professor
EURO Vice President

from EURO Vice-President

A Handbook on OR Programmes in Europe

The idea of publishing a handbook on OR/MS educational programmes leading to M.Sc., M.B.A. and Ph.D. degrees in Europe is one of several educational initiatives which may be undertaken by EURO.

Such a Handbook would be of considerable value to undergraduate students from Europe or elsewhere for selecting appropriate postgraduate programmes in OR/MS. It would also help institutions as well as enterprises in acquiring information concerning such programmes all over Europe (specific subjects of different courses, syllabus, course place and duration etc.). Such information would be particularly valuable for the purposes of planning educational and training activities for company personnel, comparing and reshaping existing programmes in University departments etc.

The handbook would be available by national OR Societies, university libraries and research institutions, managers associations, educational and other cultural organizations etc. in Europe and elsewhere .

The cost of publishing such a handbook is estimated to be about 40.000 ECU. This includes the cost

of commissioning the research required in order to acquire the data needed from educational institutions in Europe and the cost of publishing 5.000 copies of the handbook.

A proposal to the European Community for financing the publication of the handbook has already been made by the Hellenic OR society (HELORS). The proposal has been included in a project proposed by HELORS for the enhancement of cooperation between universities and enterprises. There are some chances, limited for the proposal to be approved.

In the meantime, the same proposal for financing, in whole or in part, the publishing of the handbook has been submitted by EURO to the XI-th General Direction of EC as well as to the Director of the Task Force for Human Resources, Education, Training and Youth.

Costas Pappis
Associate Professor
EURO Vice President

news from EWGs

Two distinguished MCDA EWG Members write a new book on MCDA

The new book (*) of Bernard Roy, EURO Gold Medalist 1992, Coordinator of the EWG on MCDA, and Denis Bouyssou, Programme Committee Chairman of EURO XIII, is out of press.

This book wants to be a synthesis of the major trends of research which have given rise to methods combining practical interest with scientific background. The foundation of any multicriteria approach aiming to be an aid for decision is presented. The methods are described in details. The last chapters comment and illustrate with real life applications the way to bring these methods into operation. The bibliography amounts 300 references and an index closes this book of 695 pages.

The authors feel that their book should be of interest not only to decision makers but especially to studies producers as engineers, operational researchers, informaticians, statisticians, economists or managers, furthermore advanced students will find an opportunity to be in contact with the problems and methods dealing with aid for decision.

* Aide multicritère à la décision: méthodes et cas; Economica Paris 1993.

EWG on Locational Analysis, Brussels May 9-11 1994

Announcement & Call for Papers

The seventh Meeting of the EURO Working Group on Locational Analysis will take place at the Vrije Universiteit Brussel, Brussels, Belgium from Monday, May 9 until Wednesday, May 11, 1994. Since our Working Group was born during the first EURO Summer Institute held at Brussels in the summer of 1994, the organising committee, consisting of Frank Plastria (Vrije Universiteit Brussel, Belgium - Chairman), Martine Labbe (FNRS-Université Libre de Bruxelles, Belgium), Christian Michelot (Université de Bourgogne, Dijon, France) and Dominique Peeters (Université Catholique de Louvain, Belgium) considers it as the tenth anniversary meeting, and a return to its origins.

All contributions on location, transportation and related fields are welcome, be it modelling, applications, theory or algorithms. The main aim being the stimulation of cooperation between researchers in Europe and abroad working in these fields, communications are encouraged to describe current research, even in a beginning phase, and stressing open problems. As usual, ample room will be made for discussion.

A conference fee of 1500 BEF will be asked on check-in, mainly covering the lunches at the VUB-restaurant. For postgraduate students the conference is free, but excludes these lunches. Participants are expected to cover their own travel, accommodation and further living expenses.

This first announcement serves two purposes :

- update our list of members/sympathisants of EWGLA;
- call for participants and papers for the EWGLA 7 meeting.

Time schedule

- December 1993 : second announcement with hotel information;
- January 31, 1994 : deadline for abstracts;
- March 1994 : last announcement with preliminary program.

Contact Address

Prof. F. Plastria, INVE (Research Center for Industrial Location), Vrije Universiteit Brussel, Pleinlaan, 2, B-1050 Brussels, Belgium

Tel. office: +32 2 641 3609;
Tel. secr: +32 2 641 3607
Fax: +32 2 641 3645
E-mail: FAPLASTR@VUB.AC.BE

The date of the EWGLA7 meeting was chosen so as not to overlap with the following EURO-meeting organised in Belgium, in which some of you would be interested in participating :
4th MINI EURO-CONFERENCE: RISK MANAGEMENT, Liège (Belgium) May 4 to May 6, 1994.
Deadline of abstracts : December 15, 1993.

For more information contact :
Prof. Dr. Ing. G.COLSON, EURO, Université de Liège, Batiment B31, Bte 50, B-4000 Liège, Belgium;
Tel +32 41 563188;
Fax 32 41 562821.

EVENTS

Present section was closed on 9 December, 1993; «*» denotes information featured previously.

January 11, 1993

Preference Modelling and Multicriteria Aid for Decision LAMSADE Seminar, Theme: Théorie des ensembles approximatifs et situations décisionnelles multiattributs: aide à l'explication et à la prescription, with Roman Slowinski, Paris, France; Information: Université Paris Dauphine, LAMSADE, Place du Maréchal De Lattre de Tassigny, F-75775 Paris CEDEX 16, France (tel. +33 1 44 05 4287, fax +33 1 44 05 40 91);

January 11-14, 1994

* 9th Congress on «Reconnaissance des Formes et Intelligence Artificielle», Paris, France; Information: AFCET, 156 bld. Péreire, F-75017 Paris, France (tel.: (1) 47 66 24 19, fax: (1) 42 67 93 12);

January 20-21, 1994

*8th National Conference on Quantitative Methods for Decision Making, Brussels, Belgium; Information: Dirk Cattrysse, Katholieke Universiteit Leuven, Afdeling Industrieel Beleid, Celestijnenlaan 300A, B-3001 Leuven, Belgium (tel.: +16 28 66 11 ext. 2564, fax: +16 22 23 45, E-mail: fhbbb04@blekul11);

January 25-26, 1994

*UNICOM Seminar on adaptive computing and information processing: neural networks, probabilistic reasoning and bayesian belief networks, genetic algorithms and simulated annealing, Uxbridge, UK; Information: UNICOM, Brunel Science Park, Cleveland Road, Uxbridge, Middlesex, UB8 3PH, UK (tel.: +895 256 484, fax: +895 813 095);

February 1, 1994

Preference Modelling and Multicriteria Aid for Decision LAMSADE Seminar, theme: L'évaluation contingente de la disponibilité à payer, with Marc Willinger, Paris, France; Information: Université Paris Dauphine, LAMSADE, Place du Maréchal De Lattre de Tassigny, F-75775 Paris CEDEX 16, France (tel. +33 1 44 05 4287, fax +33 1 44 05 40 91);

February 2-4, 1994

International Conference on Forecasting

Financial Markets: New Advances for Exchange Rates, Interest Rates and Stock Prices, London, UK;

Information: Christian Dunis, Treasury, Chemical Bank, 125 London Wall, London EC2Y 5AJ, UK (tel.: +44 71 777 4015, fax: +44 71 777 4774);

February 4, 1994

Session on «International Management» and «Management Onderzoek», Antwerpen, Belgium;

Information: Maggie Geuens, RUCA : Faculteit TEW-CIMDA, Middelheimlaan 1, B-2020 Antwerpen, Belgium (tel.: +3 218 04 92 or +3 218 07 28, fax: +3 218 07 13);

February 7-9, 1994

* IFAC Workshop on Man - Environment Integration, The Challenging Relationship, Lisboa, Portugal;

Information: Prof. L. Valadares Tavares, APDIO - CESUR - IST, Av. Rovisco Pais, P-1000 Lisboa, Portugal;

February 21-23, 1994

ECCOVII Conference of the European Chapter on Combinatorial Optimization, Milano, Italy;

Information: Prof. Anna Sciomachen, Istituto di Matematica Finanziaria, Università degli Studi di Genova, Via Bertani 1, I-16125 Genova, Italy (fax: +39 10 209 5243, E-mail: sciomach@imiucca.csi.unimi.it or sciomachen@hermes.dsi.unimi.it);

February 24-25, 1994

*2nd Latin-American Congress on Juridical Informatics, La Habana, Cuba;

Information: F. Hartmann Soler, Chairman, c/o Lic. N. Batard Najarro, Informatics'94 Executive Secretary, Palacio de las Convenciones, Apartado 16046, La Habana, Cuba;

February 28 - March 4, 1994

UNICOM Workshop on Introduction to Fortran 90 and Strategies for Migration from Fortran 77, London, UK;

Information: UNICOM, Brunel Science Park, Cleveland Road, Uxbridge, Middlesex, UB8 3PH, UK (tel.: +895 256 484, fax: +895 813 095);

March 1994

*4th Workshop of the German Working Group on Decision Theory, Chemnitz, Germany;

Information: Gert Wanka, Fachbereich Mathematik, Reichenhainer Strasse 41, PSF 964, D-0-9010 Chemnitz, Germany;

March 14-16, 1994

International Fuzzy systems and Intelligent Controls Conference, Louisville, KY, USA;

Information: Prof. Thomas L. Ward, Industrial Engineering, University of Louisville, Louisville KY 40292, USA (tel.: (502) 588-6342, fax: (502) 588-5633, E-mail: TLWARD01@ULKYVM.BITNET or tward01@ulkyvm.louisville.edu);

March 17-20, 1994

TIMS Marketing Science Conference on Advances in the Theory and Practice of Marketing Science, Tucson, USA;

Information: TIMS, 290 Westminster Street, Providence, RI 02903 USA (tel.: (401) 274-2525);

March 21-23, 1994

*Young OR Conference, York, UK;

Information: Sandra Weddell, Co-Chair.

YOR8, H. M. Treasury, 10/5 Treasury Chambers, Parliament Street, London SW1P 3AG, UK (tel.: +71 270 5390 (work) or +71 733 6644 (home), fax: +71 270 5653);

March 24-25, 1994 or April 7-8, 1994

* 39th EWG Meeting on Multicriteria Aid for Decisions, Poznan, Poland;

Information: R. Slowinsky, Institute of Computing Science, Technical University of Poznan, ul Piotrowo 3A, Pl-60-965 Poznan, Poland (fax: +61 782363);

April 5-8, 1994

CO94 Conference on Combinatorial Optimization, Amsterdam, The Netherlands; Information: Simone van der Wolff / CO94, CWI, P.O. Box 4079, NL-1009 AB Amsterdam, The Netherlands (tel.: +31 20 5924 189, fax: +31 20 5924 199, E-mail: co-94@cwil.nl)

April 5-8, 1994

*12th European Meeting on Cybernetics and Systems Research, Wien, Austria;

Information: Robert Trappl, Dept. of Med. Cybernetics & AI, University of Vienna, Freyung 6/2, A-1010 Wien., Austria (tel.: +43 1 535 32810, fax: +43 1 532 0652, E-mail: sec@ai.univie.ac.at);

April 18-21, 1994

The International Emergency Management and Engineering Conference, Miami, Florida, USA;

Information: TIEMEC '94, Jim Sullivan, 2995 LBJ Freeway, Suite 200, Dallas, Texas 75234, USA (tel.: (214) 888-8804, fax: (214) 270-3014, E-mail: gaa201@utdallas or gaa201@utdalls.edu);

April 24-27, 1994

TIMS/ORSA Meeting on OR/MS without Boundaries, Boston, USA;

Information: TIMS/ORSA Boston'94, c/o ORSA Business Office, 1314 Guilford Avenue, Baltimore, MD 21202, USA;

EVENTS

April 25-27, 1994

***1994 IMACS International Symposium on Signal Processing, Robotics and Neural Networks**, Lille, France;
Information: SPRANN'94, Ecole centrale de Lille, BP 48, F-59651 Villeneuve d'Ascq Cedex, France (tel.: +33 20 33 53 10, fax: +33 20 33 54 99, E-mail: SPRANN94@ldnges.decnet.citilille.fr);

May 4-6, 1994

4th EURO Mini Conference on Risk Management, Liège, Belgium;
Information: Prof. Dr. Ing. Gérard Colson, EURO, Université de Liège, Bâtiment B31, Bte 50, B-4000 Liège, Belgium (tel.: +32 41 56 31 88, +32 41 56 27 21, fax: +32 41 56 28 21);

May 9-11, 1994

7th Meeting of the EURO Working Group on Locational Analysis, Brussels, Belgium;
Information: Prof. F. Plastria, INVE (Research Center for Industrial Location), Vrije Universiteit Brussel, Pleinlaan 2, B-1050 Brussels, Belgium (tel.: +32 2 641 3609 or +32 2 641 3607, fax: +32 2 641 3645, E-mail: FAPLASTR@VUB.AC.BE);

May 9-13, 1994

***4th International Workshop on Computer Aided Systems Technology**, Ottawa, Canada;
Information: Tuncer I. Oren, University of Ottawa, Computer Science Dept., Ottawa, On, Canada K1N 6N5 (tel.: +613 564 5068, fax: +613 564 7089);

May 24-27, 1994

KR'94 4th International Conference on Principles of Knowledge Representation and Reasoning, Wien, Austria;
Information: Piero Torasso, Università di Torino, Corso Svizzera 185, I-10149 Torino, Italy (tel.: +39 11 771 2002, E-mail: torasso@di.unito.itl);

May 30-31, 1994

***2nd European conference on Information Systems**, Breukelen, The Netherlands;
Information: Walter Baets, Nijenrode University, The Netherlands Business School, Straatweg 25, NL-3621 BG Breukelen, The Netherlands (tel.: +31 3462 91275, fax: +31 3462 91250);

May 30-June 1, 1994

***CORS 1994 & Optimization Days**, Montréal, Canada;
Information: Gilbert Laporte, Programme Chairman, Centre for Research on Transportation, Université de Montréal, P.O. Box

6128, Station A, Montréal, Canada (tel.: +514 343 6143, fax: +514 343 7121);

June 1-3, 1994

***International Conference on Multi-Objective and Goal Programming**, Portsmouth, UK;
Information: M. Tamiz, School of Mathematical Studies, University of Portsmouth, Mercantile House, Portsmouth, Hants PO1 2EG, UK (tel.: +44 705 843 110, fax: +44 705 823 504, E-mail: Tamizm@uk.ac.port.cv);

June 6-10, 1994

CAISE'94, 6th Conference on Advanced Information Systems Engineering, Utrecht, The Netherlands;
Information: Gerard M. Wijers, SW Engineering Res. Centre, P.O. Box 424, NL-3500 AK Utrecht, The Netherlands (tel.: +31 30 545 412, fax: +31 30 545 948, E-mail: gwijers@serc.nl);

June 12-15, 1994

14th International Symposium on Forecasting, Stockholm, Sweden;
Information: Sune Karlsson, Dept. of Economic Statistics, Stockholm School of Economics, P.O. Box 6501, S-11383 Stockholm, Sweden (fax: +46 8 30 21 15, E-mail: ISF94@HHS.SE)

June 12-15, 1994

***TIMS XXXII Meeting on Natural Resources, Economic Development and the Environment: The Role of Management Science**, Anchorage, Alaska;
Information: TIMS XXXII - Anchorage, The Institute of Management Sciences, 290 Westminster Street, Providence, RI 02903 USA (tel.: +401 274 2525, fax: +401 274 3189);

June 14-17, 1994

***16th International Conference «Information Technology Interfaces»**, Pula, Croatia;
Information: Branka Radic, University Computing Centre, J. Marohnica bb, 41000 Zagreb, Croatia, (tel.: +38 41 518 656, fax: +38 41 518 451, E-mail: ITI@SRCE.HR);

June 15-17, 1994

11th International Conference on Analysis and Optimization of Systems, Sophia-Antipolis, France;
Information: Conference Secretary F. Tapissier, DES94 - INRIA, Rocquencourt, Bureau des Cours et Colloques, B.P. 105, F-78153 Le Chesnay Cedex, France (fax: +33 1 39 63 56 38)

June 20-24, 1994

Interdisciplinary Conference on Neural

Modelling, Lyon, France;

Information: Mme Claire Rigaud-Bully, AIDRI Bat. 101, Université Claude Bernard, Lyon 1, 43 Bld. du 11 Novembre 1918, F-69622 Villeurbanne Cedex, France (tel.: +72 44 8000 34, fax: 72 44 0573, E-mail: AIDRI@CISM.Univ-Lyon1.France);

June 22-24, 1994

*** IFAC Workshop on Intelligent Manufacturing Systems**, Wien, Austria;
Information: IFORS Secretariat, H. Weilling Secretary, c/o IMSOR bldg. 321, Technical University of Denmark, DK-2800 Lyngby, Denmark (tel. +45 42 88 14 33 / ext 3410, +45 42 88 22 22 / ext 3410, +45 45 93 12 22 / ext3410, fax: +45 42 88 13 97);

June 22-25, 1994

7th SIAM Conference on Discrete Mathematics, Albuquerque, New Mexico, USA;
Information: SIAM, 3600 University City Science Center, Philadelphia, PA, USA (E-mail: meetings@siam.org)

June 23-28, 1994

Triennial Symposium on Transportation Analysis, Capri, Italy;
Information: Prof. Lucio Bianco, IASI, National Research Council, Viale Manzoni 30, I-00185 Roma, Italy (tel.: +39 6 771 61, fax: +39 6 771 6461, E-mail: BIANCO@IASI.RM.CNR.IT);

July 4-6, 1994

*** IFAC Symposium on Identification and System Parameter Estimation**, Lyngby, Denmark;
Information: Prof. R. V. Vidal, IMSOR bldg. 321, Technical University of Denmark, DK-2800 Lyngby, Denmark (tel. +45 42 88 14 33 / ext 3410, +45 42 88 22 22 / ext 3410, +45 45 93 12 22 / ext3410, fax: +45 42 88 13 97);

July 4-8, 1994

Information Processing and Management of Uncertainty in Knowledge-Based Systems, Paris, France;
Information: IPMU'94, c/o Bernadette Bouchon-Meunier, LAFORIA-IBP, Université Paris VI, Boîte 169, 4 Place Jussieu, F-75252 Paris Cédex 05, France;

July 4-8, 1994

***VII Congreso Latino-Iberoamericano de Investigación de Operaciones e Ingeniería de Sistemas**, Santiago, Chile;
Information: Dr. Maximo Bosch, Departamento de Ingeniería Industrial, Universidad de Chile, Casilla 2777, Santiago, Chile (fax: +56 2 689 7896);

July 4-16, 1994

EVENTS

*5th International Summer School on Multiple Criteria Decision Aid, Chania, Crete, Greece;
Information: Yannis Siskos, Technical University of Crete, Greece (fax: +30 821 64824);

July 11-15, 1994

*System Dynamics Conference, Stirling, UK;
Information: Claire Monaghan, Department of Management Science, University of Sterling, Stirling FK9 4LA, UK (tel.: +786 467 360, fax: +786 467 359);

July 12-15, 1994

* 4th International Workshop on Project Management and Scheduling, Leuven, Belgium;
Information: Prof. Dr. Erik Demeulemeester, Prof. Dr. Willy Herroelen, Katholieke Universiteit Leuven, Department of Applied Economics, Dekenstraat 2, B-3000 Leuven, Belgium (tel.: +32-16-28 57 70 or 28 45 63 or 28 45 59, fax: 32-16-28 57 99, E-mail: fdbaa49@blekul11);

July 13-28, 1994

* 10th EURO Summer Institute on Combinatorial Optimization, Jouy-en Josas, France;
Information: Prof. Catherine Roucairol, Univ. Versailles - INRIA, Domaine de Voluceau, BP 105 Rocquencourt, F-78153 Le Chesnay Cedex, France (fax: +33 1 3963 5330);

July 19-22, 1994

* EURO XIII Conference, Glasgow, UK;
Information: Valerie Belton, Department of Management Science, Strathclyde Business School, University of Strathclyde, Livingstone Tower, 26 Richmond Street, Glasgow G1 1XH, UK (tel.: +41 552 4400, fax: +41 552 6686);

July 25-30, 1994

6th International Congress on Computational and Applied Mathematics, Leuven, Belgium;
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July 25-30, 1994

*4th International Statistical Institute Conference on Teaching Statistics, Marrakech, Morocco;
Information: Mr. El Ghazali Abdelaziz, Chairman of the Local Organizing Commit-

tee, I.N.S.E.A., P.O. Box 6217, Rabat Instituts, Rabat, Morocco, or Prof. Y. Escoufier Chairman of the Programme Committee, Université Montpellier II, Science et Technique du Languedoc, Place E. Bataillon, F-34095 Montpellier Cedex, France;

July 26-28, 1994

* IFAC Symposium on Transportation Systems: Theory and Applications of Advanced Technology, Tianjin, China;
Information: IFORS Secretariat, H. Weilling Secretary, c/o IMSOR bldg. 321, Technical University of Denmark, DK-2800 Lyngby, Denmark (tel. +45 42 88 14 33 / ext 3410, +45 42 88 22 22 / ext 3410, +45 45 93 12 22 / ext3410, fax: +45 42 88 13 97);

July 26-29, 1994

* Association of Asian-Pacific Operational Research Societies Conference on Development in Diversity and Harmony, Fukuoka, Japan;
Information: APORS'94, Operations Research Society of Japan, Gakkai-Centre Bldg. 4-16, Yayoi 2-chome, Bunkyo-ku, Tokyo 113, Japan;

August 1-6, 1994

* 11th International Conference on Multiple Criteria Decision Making, Coimbra, Portugal;
Information: 11th International Conference on MCDM, INESC, Rua Antero de Quental 199, P-3000 Coimbra, Portugal (tel.: +351 39 324 30, fax: +351 39 246 92, E-mail: ximcdm@inescc.pt);

August 8-12, 1994

*7th International Biometric Conference of the Biometric Society, Hamilton, Ontario, Canada;
Information: Prof. P. D. M. Macdonald, Dept. of Mathematics and Statistics, 1280 Main Street West, Hamilton, Ontario, L8S1K1, Canada;

August 15-19, 1994

15th International Symposium on Mathematical Programming, Ann Arbor, Michigan, USA;
Information: 15th ISMP, Conferences and Seminars, 541 Thompson Street, Room 112, University of Michigan, Ann Arbor, MI 48109-1360, USA (tel.: +313 764 5305, fax: +313 764 2990, E-mail: xvism@um.cc.umich.edu);

August 24-26, 1994

*7th Symposium on Transportation Systems: Theory and Application of Advanced Technology, Tianjin, China;
Information: Prof. G. G. He, IFAC/IFORS Symposium TS'94, Institute of Systems Engineering, Tianjin University, Tianjin

300072, P. R. China (fax: +86 22 358 329);

September 28-30, 1994

First European Conference on Cognitive Science in Industry, Luxembourg;
Information: R. Bisdorf, Centre de Recherche Public - Centre Universitaire, 162a avenue de la faïencerie, L-1511 Luxembourg (tel.: +352 47 02 or +352 44 01 95, fax: +352 47 02 64, E-mail: bisdorff@crpcu.lu)

September 28-30, 1994

*AILOG / AIRO Conference on Networks of Services and Firms, Methods and Technologies, Santa Margherita Ligure, Italy
Information: AILOG / AIRO Conference Secretariat, DIST, Università di Genova, Via Opera Pia 11A, I-16145 Genova, Italy (tel.: +39 10 353 2982, fax: +39 10 353 2948, E-mail: ailogairo@dist.unige.it);

October 23-26, 1994

ORSA/TIMS Joint National Conference, Emphasis: Building bridges between OR/MS theoreticians, practitioners and managers, Theme: Global Manufacturing in the 21st Century, Detroit, Michigan, USA;
Information: K. R. Chelst, Industrial and Manufacturing Engng., Engineering Building, Wayne State University, Detroit, MI 48202, USA (tel.: (313) 577-3857, fax: (313) 577-8833, E-mail: chelst@mie.eng.wayne.edu)

December 1994

*2nd International Meeting on Systems Thinking, Innovation, Quality and Entrepreneurship, Maribor, Slovenia;
Information: M. Rebernik, EPF, Univerza di Mariboru, 62000 Maribor, Slovenia (tel.: +62 28 261, fax: +62 27 056);

1995

* 11th EURO Summer Institute on Maintenance Replacement and Reliability Modelling, UK;
Information: Prof. A. H. Christer, University of Salford, Salford M5 4 WT, UK (fax: +61 7 455 999);

1995

* EURO XIV Conference '95, Israel;
Information: EURO Secretariat;

August 15-17, 1995

*6th International Conference of the Chinese Special Interest Group on MCDM, Beijing, PR China;
Information: Ku Chi-fa, Institute of Systems Science, Beijing, PR China (fax: +861 256 8364);



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