1 - A new ranking algorithm for the multiobjective shortest path problem (MSPP)

José Paixão, Dept. Statistics and Operations Research, Faculty of Sciences - University of Lisbon, Bloco C6 - Campo Grande, 1749-016, Lisboa, Portugal, jpaixao@fc.ul.pt, *José Santos*

We present a new algorithm for finding all the nondominated paths between two nodes s and t (ND s-t paths), on a network where a multiple criteria function is defined over the set of arcs. The novelty of the algorithm is that not all the ND subpaths on the network need to be found. Additionally, the algorithm fully exploits the fact that ND s-t paths are generated at a very early stage of the ranking procedure. Computational experience comparing the performance of the new algorithm relatively to the previous approaches for the MSPP is reported.

2 - A Parametric Primal-Dual Algorithm for Bi-Criteria Network Flows

Augusto Eusébio, Escola Superior de Tecnologia e Gestão , Instituto Politécnico de Leiria , Morro do Lena - Alto Vieiro, 2411-901, Leiria, Portugal, aeusebio@estg.ipleiria.pt, *José Rui Figueira, Matthias Ehrgott*

In this paper we develop a primal-dual simplex algorithm for the biobjective linear minimum cost network flow problem. This algorithm improves the general primal-dual simplex algorithm for multiobjective linear programs by Ehrgott et al. (2007). We illustrate the algorithm with an example and provide numerical results.

3 - On the Clustering of the Efficient Set for the Multi-criteria 0/1 Knapsack Problem

Luis Paquete, Faculdade de Economia, Universidade do Algarve, Campus de Gambelas, 8000, Faro, Portugal, lpaquete@ualg.pt, *Catarina Camacho, José Rui Figueira*

Given an efficient set of a multicriteria combinatorial optimization problem, a complete weighted graph is build such that each node is a solution and each weight is the distance between a pair of solutions under a given neighborhood. For a given distance, a disconnected graph is obtained by removing edges whose weights exceed that distance. Of interest is the identification of clusters since local search would be able to explore them effectively. In this talk we present experimental results for the level of clustering of the efficient set for the multicriteria 0/1 knapsack problem.

4 - Connectedness of Efficient Solutions in Multiple Objective Combinatorial Optimization

Kathrin Klamroth, Institute of Applied Mathematics, University of Erlangen-Nuremberg, Martensstr. 3, 91058, Erlangen, Germany, klamroth@am.uni-erlangen.de, *Jochen Gorski, Stefan Ruzika*

Connectedness of efficient solutions is a powerful property in multiple objective combinatorial optimization since it allows the construction of the complete efficient set using neighborhood search techniques. We show that, however, most of the classical multiple objective combinatorial optimization problems do not possess the connectedness property in general, including, among others, knapsack problems (and even several special cases of knapsack problems) and linear assignment problems as well as many optimization problems on networks.

■ WA-33

Wednesday, 8:30-10:00
Room RB 104

Multiple Criteria Decision Analysis and Optimisation IV

Stream: Multiple Criteria Decision Analysis and Optimisation (c)
Contributed session

Chair: *Aboun Nacéra*, Département Génie Industriel, Ecole Nationale Polytechnique, 10, Avenue Hassen Badie - El Harrach, 16030, Algiers, Algeria, nacera.aboun@enp.edu.dz

1 - Physical Programming for the Vendor Selection Problem

Wei-shing Chen, Industrial Engineering Technology Management, DaYeh University, 112, Shan-Jeau Rd. Tasuen, 51505, Changhua, Taiwan, weishing@mail.dyu.edu.tw

The paper presents a physical programming approach to solve the vendor selection (VS) problem which consists of determining how many and which vendors should be selected as supply sources and how order quantities should be allocated among the selected vendors. The VS method allows buyers to express their preferential structures on multiple goals. For each criterion, buyers define the regions that express the degrees of desirability. The approach eliminates the need for weight setting, and makes the VS process into a flexible and natural framework. Comparative results are presented.

2 - HA2: Hybrid Approach for impacts Assessment of urban mobility

Hichem Omrani, Heudiasyc (HDS), UTC, EIGSI - 26 rue Vaux de Foletier - 17041 La Rochelle cedex 1, 17000, La Rochelle, France, hichem.omrani@eigsi.fr, *Anjali Awasthi, Luminita Ion, Philippe Trigano*

In this paper, we propose an approach which allows a general evaluation of transport, socio-economic and pollution impacts of a measure to be carried out in transportation. Also a Web Decision Support System for Impacts Assessment of urban mobility (Web-DSS-IA) is presented. The proposed approach uses fuzzy set theory for modeling criteria, belief theory for evaluations fusion from various information sources and it is able to handle uncertainty and vagueness. A global evaluation on criteria set is done by the Choquet integral aggregation taking into account the interaction between criteria.

3 - Project of diesel group hybridization by photo-voltaic energy using AHP and PROMETHEE

Aboun Nacéra, Département Génie Industriel, Ecole Nationale Polytechnique, 10, Avenue Hassen Badie - El Harrach, 16030, Algiers, Algeria, nacera.aboun@enp.edu.dz, *Oumhani Belmokhtar, Kamelia Hammachi, Halima Belmechri*

The aim of this work is to give a decision-making aid for the best hybridization of diesel power stations by photovoltaic generators. We used for the resolution of this multiple criteria problem two MCDA methods: PROMETHEE and AHP. The hybridization project being a new one for the company, the decision maker has not sufficient information and his judgment could be more subjective. For this purpose, a modification is introduced in the pair wise comparison step of the AHP method. The obtained results are discussed and followed by recommendations.

■ WA-34

Wednesday, 8:30-10:00
Room RB 105

OR in Heath Care and Society II

Stream: OR in Health Care and Society (c)
Contributed session

Chair: *Ozgur Yilmaz*, Economics, Koc University, Koc University, College of Administrative Sciences and Economics, Sariyer, 34450, Istanbul, Turkey, ozyilmaz@ku.edu.tr

1 - Modelling and Simulating microeconomic impacts of aging societies

Andrew Zeller, Teambank AG, 90489, Nuremberg, Germany, andrew.zeller@teambank.de, *Peter Bradl*

The average age of most European societies is on an constant upward trend. This poses an all new challenge to workforce management in companies. Studies have proven that there is a significant difference between younger employees and their elder colleagues when it comes to aspects like productivity, remuneration, etc. So far, research has been focusing on mainly macroeconomic issues and neglected the impact on individual companies. Our model focuses on microeconomic aspects and supports the decision process. The data used are based on input from the National network for demographic research.