2 - Tabu Search for discrete-continuous scheduling problems with heuristic continuous resource allocation

Grzegorz Waligora, Institute of Computing Science, Poznan University of Technology, Piotrowo 2, 60-965, Poznan, Poland, gwaligora@cs.put.poznan.pl

A problem of scheduling non-preemptable, independent jobs on parallel, identical machines under an additional continuous resource is considered. The problem is to find a sequence of jobs on machines and, simultaneously, a continuous resource allocation that minimize the makespan. A heuristic approach to allocating the continuous resource is proposed. The tabu search metaheuristic to solve the problem is presented, as well as simple search methods - multi-start iterative improvement and random sampling. The algorithms are compared on the basis of a computational experiment.

3 - Approximate algorithms for high-multiplicity parallel machine scheduling problems

Giorgio Romanin-Jacur, Management and Engineering, University of Padova, Stradella San Nicola, 3, 36100, Vicenza, Italy, romjac@dei.unipd.it, *Carlo Filippi*

In many scheduling applications, a large number of jobs are grouped into comparatively few lots of identical jobs. High-Muliplicity problems result, for which standard models and methods must be suitably modified. We use a fluid relaxation of a parallel-machine, H-M scheduling problem, where every lot may be continuously split and processed on different machines, also simultaneously. We study problems with identical, uniform, and unrelated machines, and different objectives. We develop simple algorithms that are asymptotically exact for increasing lot size, and we evidence some open problems.

■ WA-18

Wednesday, 8:30-10:00
PROD Arnag 304

Public facility location

Stream: Locational Analysis
Invited session
Chair: *Daniel Serra*, Economics and Business, Universitat Pompeu Fabra, Trias Fargas 25-27, 08005, Barcelona, Spain, daniel.serra@upf.edu

1 - Optimization of Kindergarten location in Akureyri

Gudmundur Oskarsson, Faculty of Business Administration, University of Akureyri, Solborg, 600, Akureyri, Iceland, bjarnihjardar@hotmail.com, *Bjarni Hjardar*

In Akureyri, Northern-Iceland, approximately 1000 children attend approximately 15 kindergartens. The paper describes the current status, that is location and placement of each children, expected demand after five years, and presents two methods of optimazation of the problem of least traveling distance, first a simple center of gravity method and secondly a comprehensive p-median near-optimal soulution. Moreover, recommendations for future facility planning in Akureyri municipality is presented.

2 - The use of sustainability metric in Locational Analysis

José L. Pino, Estadística e Investigación Operativa, Universidad de Sevilla, Avenida Reina Mercedes s/n, 41012, Sevilla, Spain, jlpino@us.es, *Mª Teresa Cáceres*

Locational Analysis is a scientific subject of interest for a wide range of disciplines. Geography, Economics,Statistics, O.R. and Computer Science are areas with research about location problems. The frontier-like condition implies advantage for the potential range of applications. Optimally locating a facility in a network is an important problem in several fields. Some researchers have pointed out the necessity of including approaches of sustainability in facility location problems. In this paper a first approximation to the use of sustainability metric in location problems is made.

3 - A DSS for locating public facilities in Barcelona

Daniel Serra, Economics and Business, Universitat Pompeu Fabra, Trias Fargas 25-27, 08005, Barcelona, Spain, daniel.serra@upf.edu

In this paper we present a decision support system to locate fire stations in Barcelona. The model uses modern heuristics such as ant-colony and tabu search methods. It has an easy interface with the planner to decide which facilities have to be removed and where to open new ones. The software can also be used to locate any type of public or private facility in the network of Barcelona.

■ WA-19

Wednesday, 8:30-10:00
PROD Arnag 311

Managing Development Projects

Stream: Project Management & Scheduling (c)
Invited session
Chair: *Eduardo Guillén Solorzano*, Economic Analysis and Business Administration, University of La Coruña, E.U. Diseño Industrial. Dr. Vazquez Cabrera S.N., 15403, Ferrol, Spain, edugs@udc.es

1 - The Optimal Resource Allocation in Stochastic Activity Networks via the Electromagnetism Approach: A Platform Implementation in Java

Anabela Pereira Tereso, Systems and Production Department, Minho's University, Campus de Azurém, 4800-058, Guimarães, Portugal, anabelat@dps.uminho.pt, *Maria Madalena Araújo*, *Rui Novais*

An optimal resource allocation approach to stochastic multimodal projects had been previously developed by applying a Dynamic Programming model, which proved to be very demanding computationally. A new approach, the Electromagnetism Algorithm, has also been adopted and implemented in Matlab, to solve this problem. This paper presents the implementation of the Electromagnetism Algorithm using an Object Oriented language, Java, in order to take advantage of available computational resources.

2 - Simulation Based Control of Project Duration under Risk

Brigitte Werners, Wirtschaftswissenschaft, Ruhr-University Bochum, Universitätsstr, 44780, Bochum, Germany, or@rub.de

For projects, a contracted completion-date has to be met or else delay penalties fall due. If during project realisation delays occur, it must be decided on interventions. The presented decision support system for project control under risk increases the quality of planning data, such as the probability of meeting deadlines or the estimation of costs. Past or future deviations from the planned project schedule are identified in time and corrective control actions are suggested. Not only crash costs and penalty costs are taken into account but also the decision maker's risk attitude.

3 - Planning For Product Design Projects: Comparing Industry Practices To Theoretical Project Planning Methods

Eduardo Guillén Solorzano, Economic Analysis and Business Administration, University of La Coruña, E.U. Diseño Industrial. Dr. Vazquez Cabrera S.N., 15403, Ferrol, Spain, edugs@udc.es, *Susana Barbeito*, *Manuel Martinez*

In this research we aim to compare the reality existing in different industries in North Western Spain and the theoretical models to be applied to product design projects. The research was conducted by developing Design Audits in more than 50 industrial companies. The outcomes of the research show that whereas the theoretical models stand for explicit, non sequential, multidisciplinary processes, companies do apply implicit and sequential models for managing product design, reducing the opportunities for the company, and loosing control of the process.

4 - AVALGES - A Methodology for Project Evaluation and Management

Aldora Fernandes, Timbermade- Industria de Madeira, LDA, Parque Industrial de Laundos lote 41, 4900-063,