Large Social Networks Visualization Using the Algorithm of the Spanning Tree with Maximum Number of Leaves

Invited abstract in session **WE-20: Social Networks**, stream **Knowledge Discovery and Data Mining**.

Wednesday, 15:40-17:00
Room: 1.3.33A

Authors (first author is the speaker)

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Abstract

In the web 2.0, social networks easily reach of thousands or millions of actors. A clear view of a small number of vertexes is easy to obtain. However, when the number of vertexes and edges increases, the view becomes incomprehensible. In this work, we intend to find the skeleton of the social network, by transforming the graph into a tree with the largest possible number of leaves, using the spanning tree algorithm with additional constraints.

Keywords

- Data Mining
- Complex Societal Problems

Status: accepted

3 - Improving Execution Time and Accuracy for IP Classification Problems in Large Data Sets

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Many data mining applications require the analysis and classification of large data sets. Several methods exist for this task, being of particular interest Integer Programming (IP) models. However, these models' weakness is the required computational time limiting their applicability to small data sets. We present a heuristic that uses cluster analysis as preprocessing for a reduced IP model achieving both, significantly lower computational time and less classification errors.

4 - A 3PL providers classification model considering categorical variables on the use of information and communication technologies

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ICT have greatly benefited the logistics industry, allowing high levels of connectivity between partners, promoting its differentiation and specialization. To characterize the service offer, a statistics and data mining based third-party logistics providers classification model which exclusively considers the presence of technological solutions through Yes/No statements is suggested. The results identified 3PL homogeneous clusters in the Brazilian market, equivalent to those models that make use of quantitative variables, usually associated with unreliability and difficult acquisition.

■ WE-19

Wednesday, 15:40-17:00
1.3.20

Nonsmooth Global Optimization

Stream: Nonsmooth Optimization
Invited session

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1 - Asymptotic stability in optimal control problems with time delay

Musa Mammadov, Graduate School of Information Technology and Mathematical Sciences, University of Ballarat, University Drive, Mount Helen, P.O. Box 663, 3353, Ballarat, Victoria, Australia, m.mammadov@ballarat.edu.au

The problem of qualitative analysis of optimal trajectories for a special class of optimal control problems described by differential delay equations is considered. This kind of equations has attracted a significant interest in recent years due to their frequent appearance in a wide range of applications. They serve as mathematical models describing various real life phenomena in mathematical biology, population dynamics and physiology, electrical circuits and laser optics, economics, life sciences and others.

2 - Using extended cutting angle and penalty methods for solving semi-infinite programming problems

Albert Ferrer, Dpt. of Applied Mathematics I, Technological University of Catalonia, Av. Doctor Marañon, 44-50, 08028, Barcelona, Catalunya, Spain, alberto.ferrer@upc.edu

Recently a unified framework concerning to Remez-type algorithms and integral methods coupled with penalty and smoothing methods has been introduced for solving convex semi-infinite programming. The framework is theoretical and no computational results are reported. Nevertheless, it suggests new methods with interesting computational properties. We propose an specific implementation that use the Extended Cutting Angle Method as an auxiliary method of the main procedure. Computational results are reported.

3 - Direct Search Filter Methods

Aldina Correia, Mathematics, ESTGF-IPP, Edifício do Salto, n^{o}4,, blc 6, 5^o esq, 4600-281, Amarante, Portugal, aic@estgf.ipp.pt, *João Matias*, *Pedro Mestre*, *Carlos Serôdio*

Filter methods have been widely used in several areas of Constrained Nonlinear Optimization. These methods treat optimization problems as bi-objective attempts to minimize the objective function and a continuous function that aggregates the constraint violation functions. But, when the involved functions are non smooth, Unconstrained Derivative-free Methods must be used. This work presents results obtained by combining Filter method with other direct search methods and are proposed some alternatives to aggregate the constraint violation functions.

■ WE-20

Wednesday, 15:40-17:00
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Social Networks

Stream: Knowledge Discovery and Data Mining
Invited session

Chair: *Armando Mendes*, Mathematics, Azores University, Rua da Mãe de Deus, 9501-801, Ponta Delgada, Azores, Portugal, amendes@uac.pt

Chair: *Matthias Funk*, Mathematic, University of the Azores, Rua Gonçalo, 9500, Ponta Delgada, mfunk@uac.pt

1 - Large Social Networks Visualization Using the Algorithm of the Spanning Tree with Maximum Number of Leaves

Luís Cavique, DCeT, Universidade Aberta, Rua da Escola Politécnica 147, 1269-01, Lisboa, Portugal, lcavique@univ-ab.pt, *Armando Mendes*

In the web 2.0, social networks easily reach of thousands or millions of actors. A clear view of a small number of vertexes is easy to obtain. However, when the number of vertexes and edges increases, the view becomes incomprehensible. In this work, we intend to find the skeleton of the social network, by transforming the graph into a tree with the largest possible number of leaves, using the spanning tree algorithm with additional constraints.

2 - Combining Data Mining Algorithms for Web Recommendation

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Data mining algorithms are used for recommendation of pages that might be useful for the user according to past behavior (of a given user or a group of users). Combining several algorithms to optimize user satisfaction within a multi-agent environment can be done in two ways: a competitive approach, where each agent fights for grabbing user's attention, or a cooperative approach, where all agents play for the same side. In this work, both approaches were tested and a comparison of both against a single algorithm approach is presented.

3 - Integration of different Cliques of Proverbial Knowledge

Matthias Funk, Mathematic, University of the Azores, Rua Gonçalo, 9500, Ponta Delgada, mfunk@uac.pt, *Luís Cavique*

By using 14 distinct inquiries we were able to analyze the knowledge of a huge number of proverbs inside the cultural space of Azores. At Euro 2009, we developed a pattern matching algorithm by using a incidence matrix resulting from the pair wise common knowledge on the best-known proverbs. By randomly picked an inquiry and it was possible to identify an intrinsic correlation between the paremiological competence and the person's provenance. But these results must be validated with more data. Therefore, we now analyze all 14 inquiries with the same method in order to compare results.

4 - Hierarchical Clique Analysis in Social Networks Due to Common Knowledge of Proverbs

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