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Theoretical Computer
Science**

Electronic Notes in Theoretical Computer Science 281 (2011) 1–4

www.elsevier.com/locate/entcs

Preface

The Latin American Conference in Informatics (CLEI) has been held since 1974, every year in a different country of the region. Each year around 300 papers are submitted for evaluation and about one third of them are accepted for presentation. In this edition, for the first time, a selection of these papers are published by Elsevier in Electronic Notes in Theoretical Computer Science. The selection has been rather competitive and only twelve papers have been selected. CLEI is a conference that covers many different disciplines within the computer science and engineering disciplines. The conference is the home of six different symposiums that focus on following areas: 1) Artificial Intelligence, 1) Software Engineering, 3) Infrastructure, Hardware and Software, 4) Computer Graphics, Virtual Reality and Image Processing, 5) Theory and 6) Informatics and the Society. The symposiums have been chaired by José Aguilar and John Atkinson, Oscar Pastor, Yezid Donoso, Luciana Nedel, David Fernández-Baca and Gabriela Marín, respectively. The general program committee chair for the whole conference was Prof. Ernst Leiss. Selected papers have in common theoretical content and high quality. In what follows a short review of the articles published in this number is presented.

The first paper is from the Theory symposium. The paper, “Multi-objective Variable Neighborhood Search Algorithms for a Single Machine Scheduling Problem with Distinct due Windows” by José Elias Claudio Arroyo, Rafael dos Santos Ottoni and Alcione de Paiva Oliveira, compares three multi-objective algorithms based on the Variable Neighborhood Search (VNS) heuristic. The algorithms solve the single machine scheduling problem with sequence dependent setup times and distinct windows. The total weighted earliness/tardiness and the total flowtime criteria are minimized. The authors introduce two intensification procedures to improve a multi-objective VNS algorithm proposed in the literature. The algorithms are applied to solve the single machine scheduling problem with sequence dependent setup times and distinct due windows. In the experimental part, the authors evaluate the performance of the algorithms and the results show that the proposed algorithms outperform the previous ones. A statistical analysis is conducted in order to analyze the performance of the proposed methods.

From the Artificial Intelligence symposium five papers have been selected. The first one is “An Ontology-driven Document Retrieval Strategy for Organizational

Knowledge Management Systems” by Carlos Manuel Toledo, Mariel Alejandra Ale, Omar Chiotti and Mara Rosa Galli. The authors propose an organizational memory architecture, and annotation and retrieval information strategies based on domain ontologies that take in account complex words to retrieve information through natural language queries. To test these strategies, the authors have implemented a flexible framework to experiment with knowledge retrieval approaches. Finally, experimental results are evaluated and analyzed through standard measures. This is of particular importance in the business world where enterprises consider knowledge as one of the main assets with economic value.

The paper “A Neural Watermark Approach” by Jose Aguilar and Juan Anderson, proposes the coupling of a watermarking technique for images, called least significant bit, in the multiple classes random neural network. The authors introduce a training process of the watermark pattern, an embedding process of the learned pattern in the original image, and a detection process of this pattern in the carrier image. The removal of the watermark is not considered in this work, since the aim is to study the capability of detection of the proposed neural approach of any manipulation over the carrier image. The mechanism is compared with other approaches giving good performances in terms of the Peak Signal to Noise Ratio and Noise Generated Criteria.

The paper “Multiobjective Harmony Search Algorithm Proposals” by Gerán Hüttemann, Juan Ricart, Joaquín Lima and Benjamín Barán presents two proposals of the Harmony Search metaheuristic for multiobjective optimization, using the ZDT functions as a test bed. Performance metrics for experimental results show that the proposals are competitive even when compared to NSGA-II evolutionary algorithm.

The paper, “BRKGA Algorithm for the Capacitated Arc Routing Problem” by Cristian Martinez, Irene Loiseau, Mauricio G. C. Resende and Silvia Rodriguez, proposes a new algorithm for the Capacitated Arc Routing Problem (CARP). The algorithm can be applied to several real world scenarios such as street sweeping, urban waste collection and electric meter reading just to mention a few. Based on the BRKGA metaheuristic, the algorithm introduces a new random key encoding for CARP, mutation to random keys strings, a restart phase to avoid stagnation and local search. The algorithm was tested with several well-known scenarios taken from the literature. The results obtained were competitive in terms of objective function value and required computational time.

Finally, the paper “A Tabu Search heuristic for the Prize-collecting Rural Postman Problem” by Guillermo Palma, proposes a heuristic based in taboo search, in order to generate feasible solutions for solving the Prize-collecting Rural Postman Problem. This problem was recently defined and is a generalization of other routing problems. The numerical results from a series of computational experiments with various types of instances show the good behavior of the proposed algorithm in comparison with previous work.

From the Infrastructure, Hardware and Software symposium, the paper “Lagrangian Relaxation Parallel Method for Optimizing of a Hydroelectric Generation

Systemby” by Luis Fariña, Fanny González, Eustaquio Martínez, Esteban Vargas and Sebastián Arce, presents the Lagrangean Relaxation parallel method applied to the optimal commitment of generating units in a hydroelectric system. The model is implemented on a cluster built upon low cost readily available personal computers. It also introduces the algorithms applied in the above mentioned platform. The speed-up results obtained for a sample problem of rather important dimensions indicate the validity of the proposal.

The Software Engineering symposium had two papers selected for this special number. The first one is “A Model Driven Approach to the Analysis of Quality Scenarios within Self-Adaptable SOA Systems” by Boris Perez and Dario Correa; it proposes Self-adaptive behavior as a feature which architects need to include in their systems in order to improve their reliability. However, despite several ways to realize it, it is still hard to implement a self-adaptive system focused on non-functional properties. Some of the difficulties to express quality attributes in the system without combining business logic with the self-adaptation logic and to include new runtime services. of them. In this paper the authors propose a model-driven analysis approach to offer a mechanism which allow the desired quality requirements to be expressed in a simple and non-intrusive manner, to find the best services available in a system and, to offer a code generation mechanism which takes the models created under the first objective and generates the necessary code for autonomously monitoring and adapting a SOA system.

The paper “A Kernel Library to Detect and Coordinate Complex Patterns of Distributed Events” by Luis Daniel Benavides Navarro, Andrés Barrera, Kiyoshige Garcés and Hugo Arboleda presents an event-based kernel library designed to explicitly construct and coordinate complex interactions and communication patterns in distributed applications. The library integrates facilities for explicitly defining complex event patterns, detecting events in distributed systems, and validating sequences of events taking into account causal ordering. The main contributions are: An analysis of non trivial scenarios found in distributed applications in order to formulate a set of requirements and restrictions for a kernel event-based library, the design and implementation of the library supporting the detection and coordination of complex event patterns and the support of causal manipulation of distributed events, and a qualitative evaluation of the approach showing how this library can be used to build a sophisticated distributed aspect oriented language.

Finally, the Computer Graphics, Virtual reality and Image Processing symposium selected three papers. The first one is “Robust Range Finder through a laser pointer and a webcam” by Christian E. Portugal-Zambrano and Jesús P. Mena-Chalco. This paper introduces an adaptation of a scanner prototype based on a laser pointer and a webcam. It was applied to the robust estimation of absolute distance on images obtained from real time video sequences. Experimental tests were performed in order to demonstrate the effectiveness of the distance calculation in real time through a geometric model and a simple system of linear regression. From a wide data set of tests with different scanning parameter, good results on range finding were obtained.

The paper “A User-editable C^1 -Continuous 2.5D Space Deformation Method For 3D Models” by Elisa de Cássia Silva Rodrigues, Anamaria Gomide and Jorge Stolfi, presents a 2.5D space deformation method. The 3D model is modified by deforming an enclosing control grid of prisms. Spline interpolation is used to satisfy the smoothness requirement. The authors have implemented this method in an editor which makes it possible to define and modify the deformation with the mouse in a user-friendly way. The experimental results show that the method is simple and effective.

The last paper is “An Approach for 2D Visual Occupancy Grid Map Using Monocular Vision” by André M. Santana, Kelson R. T. Aires, Rodrigo M. S. Veras, Adelardo A. D. Medeiros. This paper presents an approach that uses planar information (the homography matrix) to build a visual 2D occupancy grid map from monocular vision. Initially, a segmentation step is necessary to classify parts of the image in floor or non floor. From this classification, it is possible to determine which parts of the image are unobstructed and which parts of the image are obstructions. Practical results are presented to validate the proposal.

We expect the reader to enjoy this selection that shows the high level of the research being done in Latin America and presented at CLEI.

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