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heterogeneous Multiprocessor Architecture

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Abstract—Analyse data issued from Social networks, large scale wireless networks, .. is computation intensive, and submitted to soft or hard real time constraints. The main characteristic of these kind of applications is that the execution time is greater than the deadline. Thus, mono processor architectures can not satisfy real time requirement of this type of applications. Multiprocessors nowadays architectures consists of numerous processors on one chip and allows to run tasks in parallel manner and can handle the overrun of these applications. In this paper, we present a novel online scheduler for real times tasks where execution time is greater than deadline. As application example, we use MapReduce Real time environments to extract simulation parameters and run tests on simS simulateur.

Formal Approach for GPU Architecture Schedulability

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Abstract— Parallel application modelling and specifying is not an easy task to do because it treats tasks scheduling and time evolution. Graphics processing Unit is one of the main architectures that guaranties parallel execution. Event B is a skilled formal language based on sets theories. Our goal is to model and to specify the parallel execution of programs on GPU using Event B & RODIN platform. We are interesting to timing and scheduling of tasks on GPU.

Key-Words : Parallel application, GPU, Formal specification, Timing, Scheduling, Event B.

Based refinement Verification platform for QNoC Architectures

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***Abstract*—**Formal models play an important role of the requirements that lead to models of the design for a network on chip which is a reconfigurable FPGA-based (Field Programmable Gate Array) technology for faulty tolerance System-on-Chip, where the main challenge was how to achieve a conceptual design of multiprocessor System On Chip (MPSoC). The use of formal methods with the progressive basis and the proof theory has become an essential step to design and validate this architecture. Event-B is a formal modelling language, which supports refinement as a based-formal concept of development to models and proves the industry of MPSoCs. The purpose of this article is to provide a formal verification of Network-On-Chip (NoC) architecture using the Event-B method. This process is delivered by a correct and validated formalization based on the correct-by-construction development approach.

Index Terms—Network on chip, Switch, Adaptive-routing, machine, context, Model, specification, refinement, Formal proof, Correct-by-construction, Active Zone.

Authentication and identification of individuals from the iris images

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Abstract— In this paper, we present an efficient method that allows us to authenticate and identify individuals by using iris images. In fact, the proposed method consists of three main steps. In the first step, we segment the image in order to define the upper and lower parts of the eyelids. We use two segments to exploit efficiently the region of interest of the iris and to extract only the interior half of the iris disc, which contains the most discriminate information. In the second step, the iris image is normalized by Daugman rubber sheet model, and then analyzed by bench of two 1D Log-Gabor filters to extract the texture characteristics. For the authentication and the similarity measurement between two irises, we use the Hamming distance with a threshold previously calculated. We then propose for the identification mode, a classification method based on the Multi-class SVM adopting the approach one against one. The proposed method has been tested on the Casia v1 database (756 iris images). For the authentication mode, we obtain very encouraging results: 1.39% for the global FAR, and 4.45% for the global FRR. For the identification mode, we obtain a rate recognition equals to 98.61%.

Keywords- Authentication; identification; recognition; iris; classification; Multiclass SVM.

Comparative Study of Quality Measures of Sequential Rules for the Clustering of Web Data

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***Abstract*—**To exploit large databases in the Web, data mining techniques have been applied. Among these techniques, the cluster analysis and the extraction of sequential patterns are considered to be the most important aspects in the process of exploring the web to find large groups.

Web data that we handle are streams of sequential data where time plays a vital role in sequential patterns found to extract sequential rules. In this case, the ordering of events must be taken into account in the measure of calculation in order to measure the quality and interest of a rule.

The purpose of this study is to construct a model of clustering based on the grouping of sequential rules by quality measures. We aim at the end of our study to detect a good measure of applicable data quality and provide a good partitioning through the measures evaluation of the clustering quality.

Keywords—clustering, sequential patterns, sequential rules, quality measures, Web data, measurement devaluations clusters

Exploitation of ontology by the Jena semantic API

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Abstract—Ontology's are currently among the most talked in knowledge engineering models to define structured vocabularies, gathering useful concepts in a domain and their relationships used to organize, share information unambiguously. Once created, the ontology can serve or be used directly by the user, it is necessary to represent using a formalism that will acquire its importance once integrated.

This paper presents the exploitation of ontology by the Jena semantic(Application Programming Interface) for a classification of relations in enterprise. Our approach is to read an ontology previously created via the Jena API using the Eclipse environment, in order to extract the desired information. The approach is applied to a local enterprise and the result is given in the form of relations. These relationships will be classified according to their kind in order to improve the performance of the concerned enterprise.

Index Terms— Ontology, Jena API, relationships, classification.

Toward an incremental development for real time and embedded systems

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Abstract-**This paper presents a new methodology to development complex embedded systems for hard real-time applications, based on incremental model in order to make the latter compatible with the particularities of embedded systems. In this paper, we first introduce the methodology proposed and describe it step by step, based on SART((Structured Analysis Real-Time) and MARTE (Modeling and Analysis of Real Time and Embedded Systems) profile for analysis and modeling of real-time systems.**

The suggested methodology is illustrate with a two case studies for development of hydrostatic bearing lubrication system and triaxial appartus system.

Keywords—Incremental model, Triaxial appartus system, Hydrostatic bearing lubrication system , RTES.

Real-time vibration control of rigid rotors using controlled supply pressure hydrostatic squeeze film dampers

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***Abstract*—**the aim of this research is to study the Real-time control vibration of rigid rotor using controlled supply pressure hydrostatic squeeze film dampers. A linear model of the hydrostatic squeeze film damper has been developed in order to study the effect of the supply pressure on the dynamic behaviour of a rigid rotor. A new control system is proposed to reduce the transient response of the rotor using controlled supply pressure in order to control stiffness hydrostatic bearings. The results show that it is possible to effectively monitor the supply pressure and the dynamic characteristics of the fluid inside the hydrostatic squeeze film dampers for a better control of rigid rotor vibration and bearing transmitted forces.

Keywords— Real time control vibration, hydrostatic journal bearing, linear dynamic behaviour, Squeeze film dampers, rotor dynamic

Numerical study of the influence of turbulent regime on the load capacity of a hydrostatic journal bearing

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***Abstract*—**The aim of the paper work is to investigate and predict the performance characteristics of four-pad hydrostatic journal bearings loaded between pads in both laminar and turbulent regimes. Linear modeling was performed using a numerical method to study the effects of Poiseuille Reynolds number, eccentricity, squeeze velocity and pressure ratio on the static and dynamic characteristics of hydrostatic journal bearings. The finite difference method has been used to solve Reynolds equation, based on Constantinescu's turbulent lubrication theory, governing the lubricant flow in film thickness of hydrostatic bearings. It assumed that the fluid flow is incompressible, isothermal, steady-state and inertialess fluid. The results presented in this paper are expected to be quite useful to bearing designers, in order to use it as a device for actively controlling rotors operating at high speeds.

Keywords— hydrostatic journal bearings, laminar and turbulent regimes, squeeze velocity, eccentricity ratio and pressure ratio.

Solving Non Separable Convex Quadratic Programming Problems

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Abstract: The aim of this paper is to present a new method for solving non-separable quadratic problems. In a first step we transform the non-separable quadratic problem in a separable quadratic problem equivalent. In a second step we solve the quadratic problem separable by the method of projection. The principle of this method is to calculate the critical point, if it is a feasible solution then this is the optimal solution. Otherwise, we construct a new feasible set by a homographic transformation on which we project the transformed critical point and we give the optimal solution belonging to the feasible set of the original problem. Note that the resolution is done directly on the primal separable quadratic problem and not on the linear problem as do several methods.

The method is purely analytical and avoids the thorny problem of the choice of the initial solution.

Keyword: Non Separable Quadratic Programming, Concave maximizing, Eigen values, Projection Method, Homographic Transformation.

Contribution by a hybrid algorithm to solve the multi-dimensional multiple-choice knapsack problem MMKP

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Abstract— In this paper, we approximately solve the multiple-choice multi-dimensional knapsack problem. We propose a mixed algorithm based on branch and bound method and Pareto-algebraic operations. The algorithm starts by an initial solution and then combines one-by-one groups of the problem instance to generate partial solutions in each iteration. Most of these partial solutions are discarded by Pareto dominance and bounding process leading at the end to optimality or near optimality in the case when only a subset of partial solutions is maintained at each step. Furthermore, a rounding procedure is introduced to improve the bounding process by generating high quality feasible solutions during algorithm execution. The performance of the proposed heuristic has been evaluated on several problem instances. Encouraging results have been obtained.

Keywords— combinatorial optimization, heuristics, knapsacks, branch and bound.