

CLEI Electronic Journal

Guest Editor's View

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1 Introduction

In this special issue of *CLEI Electronic Journal*, we present selected papers from the First Iberoamerican Conference on Software Engineering and Knowledge Engineering (ICSEKE 2001). This conference aims at bringing together experts in knowledge engineering (KE) and software engineering (SE) to discuss on relevant results achieved in this area. Special emphasis is put on the transference of methods between both domains. ICSEKE 2001 was held in Buenos Aires, Argentina, on June 12-15, 2001. As a response to the call for papers we received more than 30 contributions, which allowed us to select high-quality submissions. A rigorous refereeing process selected 15 full papers for presentation at the conference.

The Conference on SEKE provides a unique, centralized forum for academic and industrial researchers and practitioners to discuss the application of either software engineering methods in KE or knowledge-based techniques in SE. In 2001 conference co-chairs were Silvia Teresita Acuña (Universidad Nacional de Santiago del Estero-Argentina), Cecilia María Lasserre (Universidad Nacional de Jujuy, Argentina) and Juan Carlos Augusto (Universidad Nacional del Sur, Argentina). The keynote speakers during the event were: Ana María Moreno (Universidad

Politécnica de Madrid-Spain), Oscar Dieste (Universidad Alfonso X El Sabio, Madrid-Spain) and Juan Carlos Augusto (Universidad Nacional del Sur, Argentina).

This special issue is made up with extended and improved versions of the most relevant papers presented during the conference. The next section is a discussion of the subjects addressed by the articles published in the special issue.

2 Special Issue Composition

At ICSEKE'01 there were four main areas addressing the *intersections of SE and KE*: Software Quality (3 contributions), Process Modeling (3 papers), Software Agents (2 presentations) and Knowledge Management (1 paper). There were also contributions shown from a *SE or KE perspective*: Object Orientation (2 articles), Project Management (1 paper), Data Mining (1 presentation), Functional Languages Implementation (1 contribution) and Evolutionary Computing (1 paper).

It has been difficult to select just a few of all the interesting papers that were presented at the conference. We have chosen four articles, each from a different area addressed at ICSEKE'01. Particularly, we have chosen the papers that came out the refereeing process with the highest scores and closely related to the subjects of the CLEI Electronic Journal. The four articles we have selected fall into four categories: *Software Quality*, *Agents*, *Knowledge Management* and *Functional Languages Implementation*.

Regarding *Software Quality*, the research efforts in *testing activity* have concentrated so far on increasing the efficiency and reliability of establishment of testing criteria. Thus, a paper in this area aim to improve the generation of supporting testing tools for structural testing criteria. Silva Simao, Sugeta, Maldonao and Monard propose a flexible approach, named ProTesC, to prototype supporting tools for control and data flow based criteria. This approach is based on code instrumentation using the transformational paradigm (TXL), and analysis of the test case set adequacy using Prolog procedures. The ProTestC approach was applied to instantiate a prototype for the Pascal language and data flow testing criteria in order to perform empirical evaluations.

Agent Systems are rapidly emerging as a powerful paradigm for designing and developing complex software systems. In this sense, Stegmayer, Caliusco, Chiotti and Galli present a multiagents-based distributed decision support system for the organizational domain search and retrieval at the level of the organization. This system involves a knowledge retrieval process with its consistency and acceptability criteria, which applies case-based reasoning to route a mobile agent. The paper is focussed on the intelligence mechanism of the mobile agent-based decision support system (the Router agent). The Router agent is responsible for giving a route to the collecting agents, which must visit the system domains searching for an answer to queries formulated by a user. To perform this, the Router Agent has a knowledge base where a representation of the information managed by each domain is stored. A first prototype

for this agent-based architecture has been constructed and empirical evaluations have been performed.

The links between *knowledge management* and *organizational development processes* is a specially interesting topic. In this area, Grimán, Rojas and Pérez provide a knowledge management methodology for the business processes. This methodology consists of three interconnected components: a) a set of UML models for specifying knowledge processes and the knowledge management architecture to be implemented; b) a semantic way of arriving at the systems portfolio necessary to support the existing knowledge processes; and c) an iterative development process to go from the design stage of the business and the vision of knowledge management up to specific applications of knowledge management systems. This proposal was evaluated through the development of a knowledge management system for a Venezuelan research-oriented organization.

Because *declarative languages*, and *functional languages in particular*, are used as a means of improving the parallel software development, the fourth article addresses the implementation of functional languages for artificial intelligence and software engineering activities. In order to design and implement parallel functional languages efficiently, Morazán, Troeger and Nash propose the development of an all-software based distributed virtual memory system specifically designed for the memory demands of a functional language. They are focussed on the policy used for swapping stack pages in and out of the evaluator's local (and private) memory. Theoretical and empirical evidence is provided to show that virtual memory performance of the MT Stack is satisfactory focused in paging behavior. This results show that LRU is superior to FIFO as a page replacement policy for MT stack pages and that LRU is an optimal page replacement policy. Based on this results the MT stack page replacement policy was developed and implemented. The paper outlines the paging algorithm and presents an argument of partial correctness.

3 Acknowledgements

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Jorge Triñanes (Universidad de la República, Uruguay)

We hope this is the start of a fruitful and more systematic interchange between researchers of both communities. This should help to increase communication between areas that sometimes develop too isolated one each other. We believe both communities have interesting experiences to share and they should be encouraged to do so. Hopefully this will fuzz boundaries created by labels and conceptual simplifications that can be useful in other contexts but are also responsible of preventing a smooth and continuous growth in human knowledge about this technical field.

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