

Roger Lee (Ed.)

Software Engineering Research, Management and Applications 2011

Studies in Computational Intelligence, Volume 377

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Preface

The purpose of the 9th International Conference on Software Engineering Research, Management and Applications (SERA 2011) held on August 10–12, 2011 in Baltimore, Maryland was to bring together researchers and scientists, businessmen and entrepreneurs, teachers and students to discuss the numerous fields of computer science, and to share ideas and information in a meaningful way. Our conference officers selected the best 13 papers from those papers accepted for presentation at the conference in order to publish them in this volume. The papers were chosen based on review scores submitted by members of the program committee, and underwent further rounds of rigorous review.

In Chapter 1, Garcia Ivan et al. The main achievement of this paper, lies in the development of an integrated mechanism for assessing software processes, using a hybrid mechanism that incorporates modeling-based assessment. This mechanism was evaluated using the EvalProSoft framework and descriptive concepts, to facilitate establishing SPI initiatives in a small Mexican software company.

In Chapter 2, Dan Cramer et al. In this paper, we develop a model that will help policy makers anticipate the occurrences of emergencies. Spatial analysis methods such as hotspot analysis are used that can help policy makers distribute resources fairly by needs.

In Chapter 3, Kwangchun Lee et al. In this paper, we propose a market-driven quantitative scoping method. This method incorporates customers needs, product family structure and market strategies into scoping such that this ensures that SPL derivatives penetrate market grids.

In Chapter 4, Kazunori Iwata et al. In this paper, we cluster and analyze data from the past embedded software development projects using self-organizing maps (SOMs)[9] that are a type of artificial neural networks that rely on unsupervised learning. The purpose of the clustering and analysis is to improve the accuracy of predicting the number of errors. A SOM produces a low-dimensional, discretized representation of the input space of training samples; these representations are called maps. SOMs are useful for visualizing low-dimensional views of high dimensional data, a multidimensional scaling technique. The advantages of SOMs for statistical applications are as follows: (1) data visualization, (2) information processing on association and recollection, (3) summarizing large-scale data, and (4) creating nonlinear models. To verify our approach, we perform an evaluation experiment that compares SOM classification to product type classification using Welch's t-test for Akaike's Information Criterion (AIC). The results indicate that the SOM classification method is more contributive than product type classification in creating estimation models, because the mean AIC of SOM classification is statistically significantly lower.

In Chapter 5, Seonah Lee et al. While performing an evolution task, programmers spend significant time trying to understand a code base. To facilitate programmers' comprehension of code, researchers have developed software visualization tools. However, those tools have not predicted the information that programmers seek during their program comprehension activities. To responsively provide informative diagrams in a timely manner, we suggest a graphical code recommender and conduct an iterative Wizard of Oz study in order to examine when and what diagrammatic contents should appear in a graphical view to guide a programmer in exploring source code. We found that programmers positively evaluate a graphical code recommender that changes in response to their code navigation. They favored a graphical view that displays the source locations frequently visited by other programmers during the same task. They commented that the graphical code recommender helped in particular when they were uncertain about where to look while exploring the code base.

In Chapter 6, Haeng-Kon Kim and Roger Y. Lee. This survey report is the analysis of the model based regression testing techniques according to the parameter identified during this study. The summary as well as the analysis of the approaches is discussed in this survey report. In the end we concluded the survey by identifying the areas of further research in the field of model based regression testing.

In Chapter 7, Frederik Schmidt et al. This paper describes the initial development of a framework for automatic software architecture reconstruction and source code migration. This framework offers the potential to reconstruct the conceptual architecture of software systems and to automatically migrate the physical architecture of a software system toward a conceptual architecture model. The approach is implemented within a proof of concept prototype which is able to analyze java system and reconstruct a conceptual architecture for these systems as well as to re-factor the system towards a conceptual architecture.

In Chapter 8, Haeng-Kon Kim. In this paper, we discuss the creation of such a model and its relevance for technical design of a smart agent for u-learning mobile software system. Conventional approaches to modeling of context focus either on the application domain or the problem domain. These approaches are presented and their relevance for technical design and modeling of software for agent mobile systems is discussed. The paper also reports from an empirical study where a methodology that combines both of these approaches was introduced and employed for modeling of the domain-dependent aspects that were relevant for the design of a software component for mobile agents. We also discuss some pertinent issues concerning the deployment of intelligent agents on mobile devices for certain interaction paradigms are discussed and illustrated in the context of a u-learning applications.

In Chapter 9, Raza Hasan et al. This paper investigates software maintenance practices in a small information systems organization to come up with the nature and categories of heuristics used that successfully guided the software maintenance process. Specifically, this paper documents a set of best practices that small organizations can adopt to facilitate their software maintenance processes in the absence of maintenance-specific guidelines based on preliminary empirical investigation.

In Chapter 10, Hui Liu et al. Cell phones are among the most common types of technologies present today and have become an integral part of our daily activities. The latest statistics indicate that currently there are over five billion mobile subscribers in the world and increasingly cell phones are used in criminal activities and confiscated at the crime scenes. Data extracted from these phones are presented as evidence in the court, which has made digital forensics a critical part of law enforcement and legal systems in the world. A number of forensics tools have been developed aiming at extracting and acquiring the ever-increasing amount of data stored in the cell phones; however, one of the main challenges facing the forensics community is to determine the validity, reliability and effectiveness of these tools. To address this issue, we present the performance evaluation of several market-leading forensics tools in the following two ways: the first approach is based on a set of evaluation standards provided by National Institute of Standards and Technology (NIST), and the second approach is a simple and effective anti-forensics technique to measure the resilience of the tools.

In Chapter 11, Je-Kuk Yun et al. In this paper, we present a simple but feasible scenario that helps a package receiver simply track the current location of its delivery truck for the package.

In Chapter 12, Mohamad Kassab et al. In this paper, we propose an approach for a quantitative evaluation of the support provided by a pattern for a given targeted set of quality attributes.

In Chapter 13, Purushothaman Surendran et al. The objective of this paper is to analyze the detection performance of non-coherent detectors. The non-coherent detectors have almost similar detection probability in a background of white Gaussian noise. The performance of the detector is analyzed and simulation has been done in order to verify.

It is our sincere hope that this volume provides stimulation and inspiration, and that it will be used as a foundation for works yet to come.

August 2011

Guest Editors

Yeong-Tae Song
Chao Lu

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