

ERCIM “Alain Bensoussan” Fellowship Scientific Report

Fellow: Jorge Alberto Fox Lozano
Visited Location : NTNU, Trondheim
Duration of Visit: 9 months
Scientific coordinator: Prof. Peter Herrmann

I - Scientific activity

The growing complexity of software systems as well as changing conditions in the operating environment demand systems that are more flexible and dependable. Technologies for distributed, real-time embedded systems have evolved significantly in recent years in terms of both capability and accessibility. As a result, sophisticated yet affordable hardware devices and wireless networking protocols are now widely available and exploitable. These technological advances enable progression from standalone, static systems to cooperative systems that can be dynamically adapted at runtime. This is particularly so at the case of existing paradigms like Cloud Computing. Furthermore, within this domain the requirement to adapt to changing conditions in the environment as well as the need to deploy additional services on heterogeneous platforms motivates the use of technologies facilitating a higher level of adaptation to changes.

A number of aspects have to be controlled in order to achieve adaptations that preserve existing system specifications while incorporating new functionality or substituting obsolete services.

In particular, my scientific activity during the first period of the fellowship concentrated on the exploration of dynamic adaptation in the context of Cloud Computing. The problem under scrutiny was the growing demand and availability of this type of services and the shortage of frameworks for security analysis and quality preservation in this domain.

During this time and through constant exchange with the Networked Systems team, a first result was identification of the conceptual framework for quality preservation required for quality of service in the Cloud in the form of Service Level Agreements. A second outcome was the definition of a research proposal for the EU FP7 in the area of Future and Emerging Technologies. This proposal developed from the problems and feasible solutions identified. The consortium for the proposal was built with previous research colleagues whose number was enriched with new research partners met during the fellowship.

Moreover, I had the opportunity to participate in a training seminar on “How to write a competitive proposal for FP7” by Dr. Sean Mc Carthy, the lead expert in the field. This seminar was organized by the Research Council of Norway and was accompanied by an information event on FP7.

The FP7 proposal was further shaped after attending an information event in Budapest.

II- Publication(s) during your fellowship

1. An Exploration of Crosscutting Concerns in Software Requirements and Design. Proceedings of The 3rd International Multi-Conference on Engineering and Technological Innovation (IMETI 2011), Orlando Florida, July 19 – 22, 2011.

Abstract:

Aspect orientation is a software engineering technique that provides an enhanced separation of concerns. The idea is that concerns that affect several modularization entities, that is crosscutting concerns, C^3 can be better managed by first identifying and then weaving them into selected entities.

This is supposed to improve modularization of software, facilitate reuse of code or software components, and support software evolution. In this work, we explore C^3 and their relation to aspects.

The thesis is that crosscutting originates during the transformation of requirements into software design or specification entities.

We define C^3 through a tracing relation from requirements into specifications and from specifications into design entities. We illustrate the translation of requirements into use cases and these into formal specifications in a first order language, Alloy. These relations help to identify candidate C^3 from the specifications. Furthermore, we propose a classification of C^3 based on the classification of requirements.

2. The Minister's Black Veil.

The 5th International Conference on Knowledge Generation, Communication and Management: KGCM 2012. Special Track on Peer Reviewing: PR, Orlando Florida, July 19 – 22, 2011.

Abstract:

Ensuring quality and reliability of research, as well as, ensuring that funds invested in it are appropriately assigned is in the interest of the scientific community as a whole. Peer Reviewing (PR) has been so far the most widely used process to guarantee these objectives. PR is in most cases the only criteria to accept or reject an article for publication in journals, conferences, and workshops. In this paper, we identify salient issues and areas of improvement, illustrate the drawbacks in the current practice of PR at the hand of the Australian evaluation system ERA, and propose a new PR model.

III -Attended Seminars, Workshops, and Conferences

1. Mobile Cloud Computing Forum, London, December 1,2, 2011.
2. Information Meeting for FP7 Proposals in Oslo, May 3, 2011. Organizer: The Research Council of Norway.
3. ICT Proposers' Day, Budapest 19-20 May, 2011.
Presentation held for the Panel on Objective 1.2 Cloud Computing.
4. Teacher Training Seminar for PhD Students and Doctoral Research Fellows, Norwegian University of Science and Technology, Spring 2011.

IV – Research Exchange Programme (12 month scheme)

Please identify the name(s), date(s) and place(s) of your Research Exchanges during your fellowship period and detail them .

Not applicable