

Faculty Exchange Program - Fall 2010 - Final Report

Professor Hans Peter Reiser, FCUL

This report summarizes the activities executed during my stay at Carnegie Mellon University for the Fall 2010 semester, from August 26 to December 20.

I have been responsible for teaching a master-level course “Fault Tolerant Distributed Systems” (18-749A&PP), with 7 local students at CMU. The course was also taught via video conference to Portugal, with 1 student at Universidade de Porto and 7 students at FCUL from the CMUPortugal dual-degree MSIT-IS master program. The complex setup with students in different places and very heterogeneous backgrounds and the new environment and infrastructure was challenging and rather time-consuming, especially during the first weeks. The support received at CMU, particularly from my course assistant, Bara Ammoura, and from INI technicians, was outstanding and very helpful. Altogether, it was a pleasure to work with a group of highly-motivated students, and the class provided me with a very exciting and valuable teaching experience.

I was also involved in three master theses of CMUPortugal MSIT-IS students, where I participated either as the thesis reader or as the thesis committee president.

The research environment at CMU is noteworthy for various reasons. There is a large number of research talk every week, from both local and external invited speakers. This offers an excellent opportunity to establish connections to other researchers. In addition, it provides not only great opportunities for discussions, but also yields lots of inspiration for one's own work. Furthermore, all CMU faculty and researchers that I met during my stay were always available and interested in discussing both their research and mine.

At CyLab, I joined Prof. David Brumley's AEG research group, where I attended the weekly group meetings. This provided me with a good opportunity to learn more details about the group's research, especially regarding binary analysis. I was invited to give a talk about my own research on virtualization-based intrusion tolerance. Following discussions about my research also yielded new ideas for future work. Particularly, we discussed the potential of adapting my replication architecture for testing software patches. The basic idea is to execute a patched and an unpatched version of some software in parallel in virtual machines and to detect problems caused by the patch by comparing the behavior of both. The available time during my visit was not enough to develop these ideas into a working prototype or a full conference publication. The ideas, however, have the potential for future research collaboration.

As a further activity, participating in the weekly CyLab student seminar enabled me to get a better understanding of the various research lines present within CyLab.

Another positive experience was getting in contact with Prof. Anupam Datta and discussing with him about formal verification of a hypervisor. While formal verification is not a central part of my own research background, it is highly relevant for my work on trustworthy virtualization-based infrastructures. It was valuable to learn more about ongoing work at CMU in this field.

Overall, my visit to CMU was a great experience, both technically and culturally, and I can recommend an exchange visit to anyone involved in the CMUPortugal program.