

## ***CMU|Portugal Faculty Exchange Report*** *Spring 2014*

This documents provides an overview of the activities carried out while visiting CMU during the Spring of 2014. The main goals of my visit were: to learn new teaching methodologies, be exposed to new research practices and develop contacts for future collaborations. All these objectives were fully accomplished.

When I arrived at CMU, in late February, classes had already started over a month ago, limiting collaboration opportunities. I decided that the best way to become acquainted with CMU's teaching practices, would be to follow some courses. I selected three courses that are either similar to the ones I teach in Portugal or close to my areas of interest. Due to scheduling conflicts, I focused primarily on the MSc level *Wireless Sensor Networks* course, taught by Prof. Raj Rajkumar, while attending some classes from the BSc level course *Computer Networks* and the MSc level course *Internet Services* by Professor David R. O'Hallaron. I also attended one class of the MSc level course *Great Theoretical Ideas in Computer Science*.

In these courses I witnessed a great variety of teaching and course organization techniques, ranging from classic lectures to student driven classes with group discussion. I will be trying the latter on one course in the next semester. Projects were an important part of the courses, which is consistent with our practices at IST. However, T.A.s play an important role, aiding students and releasing Professors from a significant effort.

While staying with Professor Fernando de la Torre's group, I was able to observe a large group of students and researchers centered around a single Professor. This contrasts with my Portuguese experience, where groups have more professors and a smaller student to professor ratio.

During my stay I met Professors Mario Bergés and Anthony Rowe, who have a project on Building Automation Systems using, among others, Wireless Sensor Networks, entitled Mortar.io. I was given the chance to participate in this project, for which I developed a FUSE File System interface for reading sensor values and activating actuators. This work was presented as a non-refereed poster at the OpenBAS workshop. This and other contribution have led to my participation in a paper currently being written for submission to the BuildSys 2014 conference.

My collaboration with Professor Anthony Rowe and his group led me to propose a novel ultrasound localization technique using beam-forming. The experimental work I started is being continued by Patrick Lazik, a PhD student under Professor Anthony. We intend to submit a paper this month, to IPIN 2014, for which an abstract has already been reviewed and accepted.

I expect my collaboration with CMU's faculty to continue. Since my return, I have been participating in meeting via Skype, and have been working on the two papers mentioned. Given the common areas of interest, a MSc student of mine applied for a student mobility scholarship in order to further explore the collaboration opportunities identified.

During my stay, I also had the chance to attend four talks on subjects such as Wireless Sensor Network Security, applications of computer vision for movie special effects or the expected impact of the hardware evolution of RAM and multi-cores.

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