Prof. Dr. João Barros
DEEC/FEUP
Rua Dr. Roberto Frias s/n
4200-465 Porto
Portugal

Final Report on the Faculty Exchange Program
at Carnegie Mellon University

João Barros, Universidade do Porto, jbarros@fe.up.pt

This document provides a summary of the activities accomplished during my professional stay at Carnegie Mellon University (CMU), which took place in the period of July 1 to August 31, 2012. While at CMU, I received a joint appointment at the Department of Engineering and Public Policy (EPP) and at CyLab, where I interacted with several different colleagues and students.

At EPP, I took the opportunity to learn more about the methodologies of policy analysis by assisting Prof. Granger Morgan in preparing for his course in Introduction to Theory and Practice of Public Policy Analysis, which will be held in the Fall 2012. This included reviewing the syllabus and several chapters of Prof. Morgan's manuscript on this topic and discussing their content. I also gave feedback on the abstract submitted by the first-year EPP students in preparation for their qualifying exam and participated in the faculty meeting that decided whether the abstracts were satisfactory or not. On the research side, I had discussions with Prof. Inês Azevedo on EPP research methodology and worked closely with Prof. Pedro Ferreira and our joint student Alex Ligo in understanding how vehicular mesh networks can be used to offload cellular mobile data traffic and what kind of incentives (if at all) the government should set in place to promote the fast adoption of vehicle-to-vehicle and vehicle-to-infrastructure communication technologies.

At CyLab, I worked with Prof. Virgil Gligor on a theoretical framework for anonymous communication based on concepts of computational complexity and modern cryptography. We also discussed the work of our jointly co-supervised student Saurabh Shintre, who is working on a model for the detection of certain applications in encrypted Internet traffic. I also interacted significantly with Prof. Anthony Rowe on topics related to sensor networks and mobile ad-hoc networks. In particular, we formulated a communications problem related to sharing control messages among multiple unmanned aerial vehicles, which will serve as starting point for our jointly supervised student Luis Pinto. From Prof. Raj Rajkumar, I was able to learn more about the plans of the Department of Transportation regarding vehicular networking trials in the United States and the ongoing research activities supported by General Motors.

Beyond my work with members of EPP and CyLab, I also had meetings with several other faculty members and researchers. Prof. José Moura and I deepened our discussion on the second phase of the

Prof. Dr. João Barros
DEEC/FEUP
Rua Dr. Roberto Frias s/n
4200-465 Porto
Portugal

Carnegie Mellon Portugal program. From Prof. Ed Schlesinger, I was able to learn about the organization and policies of the Department of Electrical and Computer Engineering. I also discussed the Silicon Valley campus of CMU and smart city research with Dr. Jane Siegel and Prof. Martin Griss. Several conversations with researchers were prompted by the talk I gave on July 17, 2012, entitled "User-Centric Research for Smarter and Safer Cities". The feedback I received is of great value as we build and expand the recently funded Center of Competence for Future Cities at the University of Porto.

In conclusion, this was no doubt a very productive and successful stay. Beyond helping to push further the aforementioned research and education activities, which I will continue to carry out with colleagues and students at CMU, this stay allowed me to reflect more deeply about how to build institutions that can really make a difference, both locally and internationally. I am very grateful to the Portuguese Foundation for Science and Technology (FCT), Carnegie Mellon University and the leadership team of the Carnegie Mellon Portugal program for making this possible.