

Happy New Year 2010

Two Portuguese Ph.D. Students Pass Qualifier Exam and Comment on their Experience

The qualifier exam evaluates the student's general knowledge and preparation for undertaking a doctoral program in his or her chosen area of study. Recently, two Portuguese Ph.D. students in Electrical and Computer Engineering (ECE), under the Carnegie Mellon | Portugal Program, took their qualifier exam after only two months of study at Carnegie Mellon University. Jerónimo Rodrigues and João Mota were encouraged to take the exam by their professors, and they made it through with good results.



João Mota

"I cannot say the qualifier is a pleasant experience," says Mota. "In ECE, [the exam] consists of three people trying to find flaws either in your research or in your background knowledge." In Mota's case, the adjudicators focused on the applications of his research, which is to develop distributed algorithms that are

as fast, or faster, than the centralized ones. More specifically, compressed sensing is a new paradigm in the acquisition of signals that states that it is possible to acquire signals in an already compressed form [in the usual paradigm the signals are compressed only after their acquisition]. This theory has countless applications." Mota says that practical application is the weakest part of his research because he is doing "something that nobody else had tried before." Mota's goal is "to give my contribution to the theory of compressed sensing."

"Perhaps the most important aspect of the Carnegie Mellon | Portugal Program is the interaction with the faculty and students of both universities," says Mota.

Rodrigues says that he could have improved his score if he had taken the exam at a later date, but he is glad to have gotten it out of the way. "It is good to know early if we meet the requirements that Carnegie Mellon sets for a student," he says.

Rodrigues' work involves "a Vision algorithm compiler, for the Honda industries," the major goal of which is "to automate the process of inserting parts onto an assembly line."

Mota and Rodrigues both have some advice for their colleagues who will take the qualifier exam. Their first tip is to know the requirements of the qualifier and what is expected of the student who is taking the exam.

"You should know how to give a general idea," says Mota, "not only of the proofs of your results, but also of the proofs of other people's results that you use in your work. It is also important that you know the definition of all the important words you say and write."

Rodrigues encourages students to meet frequently with both advisors, from Portugal and from Carnegie Mellon University.

As a final suggestion, Mota says, "don't panic. The goal of the qualifier is to see if we can represent Carnegie Mellon at a scientific conference. So, expect the committee to be aggressive [in the nature of the questions]. It is their role to question every detail of your work and this might be uncomfortable to you. Instead of panicking, try to get out of that area of discomfort graciously, by leading the conversation to where you want."



Jerónimo Rodrigues

Useful link: <http://www.ece.cmu.edu/graduate/forms/ECEQualSummaryForStudents.pdf>

Read full interviews at <http://www.cmuportugal.org/tiercontent.aspx?id=2268>
<http://www.cmuportugal.org/tiercontent.aspx?id=2270>

The mission of the Carnegie Mellon | Portugal Partnership is to create new knowledge in key focused areas of information and communications technologies by means of cutting-edge research, world-class graduate education, and a close connection with Portuguese Industry, thus placing Portugal at the forefront of Science and Innovation.

Academy on Security and Dependability

Between December 14th and 15th, 2009, more than 20 Portuguese professionals from several companies attended the first Carnegie Mellon | Portugal Program Academy on Security and Dependability. The event was organized by Large-Scale Informatics Systems Laboratory, at Faculdade de Ciências da Universidade de Lisboa.

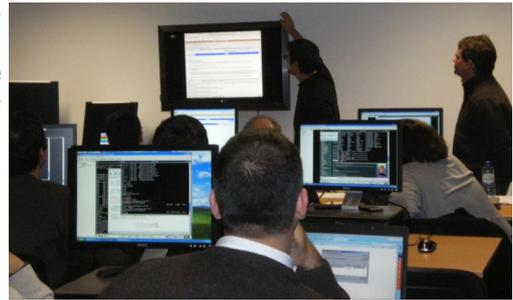


The academy provided computer science and engineering professionals with the opportunity to interface with the experts involved in the Carnegie Mellon University | Faculdade de Ciências da Universidade de Lisboa dual Professional Master of Science in Information Technology–Information Security (MSIT-IS).

Miguel Correia, from Faculdade de Ciências da Universidade de Lisboa (FCUL), and Rajeev Gandhi from Information Networking Institute (INI), Carnegie Mellon University, gave a presentation about the MSIT-IS program and its achievements. Since the program's inception, the number of participating students has increased every year.

Miguel Correia gave another presentation titled "Six Billion Crash Test Dummies or Why Software Security Matters," and the main conclusions are that "software security is very interesting, but difficult because new vulnerabilities appear every day, and we need to be prepared to find new solutions every day."

Paulo Sousa, from FCUL, spoke about "Surviving Non-Detectable Intrusions While Fighting Them Back." For him "intrusion tolerance added to Proactive Resilience is an effective way to survive on detectable and non-detectable intrusions."



"Can Cost-Benefit Analysis Help Investment in Security?" Asked Pedro Ferreira.

Pedro Ferreira, from Instituto Superior Técnico (IST), gave the presentation "Can Cost-Benefit Analysis Help Investment in Security?" He encouraged listeners to view security as an investment and approach security with the underlying thought: "You are ok with some intrusions/attacks in your system" and the goal is to achieve the strategic point, the balance between cost and benefit.

José Rufino, from FCUL, in his presentation about "Building Robustness, Safety and Security for the Next Generation of Aerospace Systems," gave some examples to address current trends in the design of the future generation of aerospace systems, discussed the paradigms, the models and the tools that currently are being developed to ensure the provisioning of high levels of safety, security and timeliness guarantees.

During two days the participants attended lectures and workshops such as:

- Evolution of Security: from Ad-hoc Prevention to Automatic Protection;
- Six Billion Crash Test Dummies or Why Software Security Matters;
- MSIT-IS - A Carnegie Mellon University and University of Lisbon Masters;
- Hands-on 1 - Securing Installation is harder than it looks;
- Hands-on 2 - Attack Injection: Assess your Software Before Hackers do it; Are They Out There? How Many and How Smart?;
- The Delicate Balance between Distributing and Losing Control;
- Surviving Non-Detectable Intrusions While Fighting Them Back;
- Can Cost-Benefit Analysis Help Investment in Security?;
- Building Robustness, Safety and Security for the Next Generation of Aerospace Systems;
- Hands-on 3 - Honey pots: Watching Hackers at Work.

Paulo Veríssimo, from FCUL, added that "it is possible to estimate the hacker attack cost, and based on this value elevate the cost level to dissuade the hacker attack." For Veríssimo, the academy "model and setting was to make it a teaser of what happens in the MSIT-IS program and a discussion forum on Security and Dependability." The academy participants gave "wonderful feedback and got out of there with their minds set on applying," he said.

At the end of the academy, the participants were invited to participate in the "Penetration Testing Trophy," where they received an IP (Internet Protocol) address and their goal was to imagine a gold bar inside the computer, so they had to go and get it. This challenge was won by two participants from Portugal Telecom, "who already trained several other people in our program," explained Veríssimo.

Participants in the event: PORTUGAL TELECOM; UNISYS; LOGICA; BLUE PHOENIX; EFACEC; INST. DEFESA NACIONAL; INST. POLITÉCNICO BEJA; ESPÍRITO SANTO INFORMÁTICA; KPMG; STREAMLINE; CRITICAL SOFTWARE.

MSE Seminar Tour Provides Critical Link between University and Industry

Every year, Paulo Marques, coordinator of the Carnegie Mellon Portugal | Universidade de Coimbra Master in Software Engineering (MSE) Programs, and his team organize a Seminar Tour about Software Development.

The yearly theme of the Seminar Tour is "hot and current topics on software engineering," and it has two goals: "on one hand, it allows us to interact with industry and try to pass on the current best practices and state-of-the-art knowledge in the area. Thus, in a very direct way, we are trying to improve how software and innovation is done in our economic fabric. On the other hand, it allows us to promote the MSE program and show the relevance of having professionals enroll and do this Carnegie Mellon|Portugal [professional] master's program."



Between October and December of 2009, the MSE Seminar Tour was attended by more than 200 professionals and touched cross-sectional issues such as: Risk Management for Software Projects, Agile Software Development with SCRUM, Dynamic Teams and Groups, Software Development Methodologies. Marques explained that "when you develop software there are three main components that must be in place for a project to be successful: technology, people and processes."

"Many times projects fail not due to technology," said Marques, "but due to improper management of people (e.g., customer expectations and relationship, team dynamics, interactions with management, conflict mitigation) and processes (e.g., not systematically doing quality assurance, tracking project progress, risk management and mitigation, etc.)." Some of these seminars occurred at companies like PT Inovação and Novabase.

It was "thrilling to see companies recognizing and investing so heavily on advanced training," said Marques.

With respect to the future of the Seminar Tour, Marques said that the "initiative is only going to grow," because "it provides us with a critical link to interact with industry and act as agents of change in our economic fabric." "The University of Coimbra, in partnership with Carnegie Mellon, feels a particular obligation in contributing to the society at large and to advance the stage of knowledge and practice in industry," Marques said. "These seminars are a way to do so."

Read full interview at <http://www.cmuportugal.org/tiercontent.aspx?id=2272>

Student Profile: Cristina Carias, a Ph.D. Student in TCE

Cristina Carias is a doctoral student in the Carnegie Mellon | Portugal Technological Change and Entrepreneurship Ph.D. program. Carias holds a BS in Physics Engineering and an MS in Engineering and Management of Technology, both from the Instituto Superior Técnico, Lisboa, Portugal. She also holds a Certificate in Econometrics and Applied Prediction from the Instituto Superior de Economia e Gestão.



Cristina is broadly interested in understanding the causes of industry agglomeration, and how clusters emerge in an apparently homogeneous landscape. In particular, she is studying the factors that determine location and performance of entrepreneurs.

The research couples Portuguese data resources (a unique dataset that traces all the workers and firms in the Portuguese economy for over twenty years) with Carnegie Mellon's experience in industry agglomeration. The novel data allows for a fresh look into the micro-dynamics preceding the birth of a new firm, and how this birth affects established firms.

Her experience in the program has been extremely positive. After spending the first year in Portugal ta-

king courses, Cristina came to CMU, to complete her coursework and work more closely with the CMU members of her committee. Her committee is constituted by Steven Klepper (chair), Rui Baptista (from Instituto Superior Técnico) and Serguey Branguinsky. The dual character of the program has revealed how different universities approach science and research.

"In terms of academic excellence there is no doubt that this is a highly competitive program," said Carias.

Mark on Your Calendars:**Industry Forum and Diploma Ceremony 2010**

The Carnegie Mellon | Portugal Industry Forum and Diploma Ceremony will be held on February 22nd, 2010 at Universidade de Coimbra, Portugal. This ceremony will celebrate the achievements of the 2008 and 2009 graduates and foster a closer relationship with the Industrial affiliates.

More information at www.cmuportugal.org.

Program in the Portuguese Media

Faculty Exchange Program between Portugal and EUA
in *Expresso*, December 19th, 2010 [read](#)

New Interactive Technologies Institute starts in January 2010
in *Diário de Notícias da Madeira Online*, December 15th, 2010 [read](#)



Capstone Project Presentation in Madeira
in *Jornal da Madeira Online*, December 15th, 2010 [read](#)

**National Director talks about Futuyre Networks
(Portuguese Cable Tv)**
[video](#)

[Read more](#)

Vikram Gupta received a Best Paper Award at an International Conference

Vikram Gupta, a Ph.D. student in the Electrical and Computer Engineering (ECE), under the Carnegie Mellon | Portugal Program, received a Best Paper Award at ACM Sensys 2009 - Conference on Embedded Networked Sensor Systems, the flagship conference of the wireless sensor networks community. Gupta is the co-author of the paper titled "Low-power clock synchronization using electromagnetic energy radiating from AC power lines." His co-advisors are Raj Rajkumar and Eduardo Tovar.



Read full article at <http://www.cmuportugal.org/tiercontent.aspx?id=2266>

Announcements

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