External Review Committee (ERC) members state: "There has been impressive progress"

The third meeting of the External Review Committee (ERC), for the collaborative program between universities in Portugal and Carnegie Mellon University in the USA – Carnegie-Mellon | Portugal Program in Information and Communication Technologies - took place over the five day period September 14th to 18, 2009.

The Committee commented as follows [public statement]:

"This is a visionary initiative to advance yet further the standing and standard of research and postgraduate education in Information and Communication Technology in Portugal; there has been impressive progress since our last visit in November 2008.

As previously we met with a wide range of people involved: the Secretary of State for Science, Technology and Higher Education; the President of FCT and the Executive Director for International Partnerships at FCT; the two program directors (from Carnegie Mellon University and the National Director, Portugal); participants in the program (course leaders and faculty both from Portuguese universities and from Carnegie Mellon; industrial sponsors; a number of students and post-doctoral researchers) and the Board of the program. We are once again most appreciative of the positive and open way in which all involved engaged with us during our review visit. We especially commend the way in which the Board has responded positively to the recommendations we made last year. The program is necessarily substantial in scale and scope. It involves professional Masters programs.
aimed at professionals in industry, dual degree PhD programs and collaborative research projects – all with a commendably high degree of industrial involvement and commitment. We recognized in our report last year that as the program continued to expand it would become necessary for the management structure and arrangements in Portugal to evolve to meet the challenge of increasing complexity. The new arrangements developed and put in place this year are commendable and in our view represent an appropriate, very positive response to this perceived need. They should help achieve the necessary agility and ensure that the benefits can become deeply embedded and sustained in the university system in Portugal. In this context we are particularly supportive of the way in which the academic and industrial research community in ICT in Portugal has been involved in the shaping and refinement of the Strategic Plan for the program; this pattern of strong engagement is a very positive feature that should be maintained.

The high caliber of the students that have been attracted to the dual degree PhD programs, from Portugal and more widely around the world, is impressive indeed. The distinctive international experience afforded by the program – with study and research in both Portugal and at Carnegie Mellon University in the USA - augers well for the development of future leading researchers for the Information and Communications Technology sector in Portugal – in industry, academia and as contributors also to public policy areas. This is the case also for the dual degree professional masters programs in which there is full and intimate connectivity to counterparts offered by Carnegie Mellon in Pittsburgh. The students benefit greatly from undertaking a substantial period of study at Carnegie Mellon; faculty movements in both directions help ensure real coherence of educational experience as well as equivalence of standards; student project work undertaken at Carnegie Mellon linked with companies in Portugal builds relationships for future collaborative research projects. And indeed, a significant set of collaborative research projects have been developed this year, each generally involving faculty/researchers from more than one university in Portugal, researchers at Carnegie Mellon and industry in Portugal.

It is particularly pleasing to see the extent to which the number of companies involved with the program in this way has grown over the last year. This industrial engagement in the research projects provides a most valuable channel to enable the ready flow of the fruits of research towards economic and societal impact. And there is already clear evidence of benefits of this nature being achieved. Most notable is that during this year the program has stimulated new institutional developments, linking academia and industry in Portugal with active engagement also of Carnegie Mellon. In particular the proposed Institute in Madeira relating to Human Computer Interaction (HCI) and two other centers of expertise linking industry and universities dealing with Software Engineering and with Security respectively – are important areas for the further development of the ICT sector in Portugal. These developments represent tangible valuable outcomes of the collaboration between academia and industry in Portugal, catalyzed by the relationship with Carnegie Mellon. Once again we express the view that faculty both at Carnegie Mellon and in Portugal are to be congratulated for the further impressive progress that has been made - to a greater extent than we would have thought could have been achieved by this time. It is clear to us that the Carnegie Mellon|Portugal Program is contributing substantially to the transformation of university research and graduate education in Portugal, ensuring that the very highest international standards of excellence are attained.”

Professor Sir John O'Reilly, Cranfield University, UK (Chair)
Professor Luigia Carlucci Aiello, Sapienza University of Roma, Italy
Professor Tariq Durrani, Strathclyde University, UK
Professor Joel Moses, MIT, USA.

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Moments: Carnegie Mellon|Portugal Program Organizes Orientation Day in Aveiro

More than 20 new graduate and Ph.D students enrolled in the Carnegie Mellon|Portugal Partnership enjoyed an informative orientation experience Sept. 13, 2009 in Aveiro.

The successful orientation gave students and faculty an opportunity to get better acquainted with the program, including the ICTI executive teams from both Portugal and Carnegie Mellon, the country and their peers.

During morning sessions at the Universidade de Aveiro, a handful of international students discussed their experiences in the program. Students involved in the presentation included Mate Boban (Ph.D. in ECE), Eugene Daniliks (MHCI), Cristina Carias (Ph.D. in TCE), Rita Ferreira (Ph.D. in Math) and Sergio Pequito (Ph.D. in ECE) talked about how easy is to find help and solve problems in Portugal. The students also talked about the country’s food, the people and what it is like to live in Portugal.

Other orientation day discussions involved ICTI@Portugal’s Sanja Sontor and Lori Spears from ICTI@CMU. Both talked about issues relating to residency in Portugal and the health system in Portugal. Carnegie Mellon’s Francisco Veloso, an assistant professor in engineering and public policy, gave an informative presentation about the dangers of plagiarism.

Following lunch, all students participated in an innovative team-building activity called, “PediPaper.” Students were divided into four different teams. They then spanned out into the city to participate in a fun-filled scavenger hunt complete with mystery clues and questions. The winning team was “Mercanteis,” but the real victory was the excellent teamwork displayed by all participants.
The ICTI@CMU office held its second annual student orientation on August 14th in Hamburg Hall at Carnegie Mellon. The orientation was attended by 27 students who traveled from a variety of countries including Serbia, Brazil, Ghana, Canada, India, England, China and Portugal.

The purpose of the orientation was to assist students in their educational experience by providing program history and information about academic procedure. Faculty and students enjoyed refreshments and program overviews were given by Lori D. Spears, ICTI associate director, and Francisco Veloso, program area coordinator and an assistant professor in engineering and public policy at Carnegie Mellon. Peter Steenkiste, program area coordinator and a professor in computer science and electrical engineering at Carnegie Mellon also was an active participant in the orientation process.

Each presenter highlighted various components of the program including academic, educational and administrative.

Three returning students, Carla Maria de Rosário Costa, Rita Ferreira and Mary Alexandre Luis Barreto made presentations which highlighted their involvement and experiences in the partnership. The students shared best practices, challenges and success stories that they have experienced since being enrolled.

Approximately 140 students are enrolled at campuses in Portugal and the United States. This year, the ICTI program admitted a total of 67 new students for both the U.S. and Portuguese campuses: 47 professional masters students and 20 Ph.D. students.

In 2006, Carnegie Mellon University and the Portuguese government, through its Ministry of Science, Technology and Higher Education, entered into a long-term collaboration to expand research and education in the area of information and communications technology.

This collaboration includes the emphasis on information processing and networking, including applications to critical infrastructures and risk assessment, as well as complementary areas of applied mathematics, technology, innovation and policy.
New Interactive Technologies Institute Kicks off in Madeira

More than 70 people attended a ceremony to kick off a new Interactive Technologies Institute (ITI) in Portugal.

The new institute will operate as a separate department, with the primary objective of maintaining relationships and projects for sustainable and long term cooperation with other institutions at Carnegie Mellon University. The institute emulates the success achieved in the dual professional master’s degree in Human-Computer Interaction (HCI), under the Carnegie Mellon|Portugal Partnership.

A broad swath of government leaders and professionals attending the ceremony included: Mariano Gago, minister of science, technology and higher education in Portugal; Manuel Heitor, secretary of state for science technology and higher education in Portugal; Madeira Regional Vice President João Cunha e Silva; Carnegie Mellon University’s Vice President and Provost Mark S. Kamlet; University of Madeira Rector Castanheira da Costa; José M.F. Moura, director of the Carnegie Mellon|Portugal Partnership at Carnegie Mellon and Nuno Nunes, one of the scientific directors of the Carnegie Mellon|Portugal Partnership and the initiator of Madeira—ITI.

Madeira Program Focuses On Consistent Success

The University of Madeira’s professional master’s program has been extremely successful in attracting talent and building critical mass in the interdisciplinary area of human computer interaction. “This is a project of strategic leadership, resulting in a high-level partnership. An example to be followed by other Portuguese universities,” said Mariano Gago, minister of science, technology and higher education in Portugal. His view was shared by Carnegie Mellon Provost Mark S. Kamlet.

"We are small universities with big ambitions, so we must choose areas and regions where we can make a difference, where we are known as centers of knowledge and engines of economic growth,” said Kamlet.

“This is a very natural step in the progression of the partnership.” Castanheira da Costa stressed that this initiative demonstrates that “we are able to innovate.” José M.F. Moura also said he was very pleased to see such an accomplishment after the first two years of the partnership.

Video of the Madeira-ITI quick off ceremony is available at http://www.uma.pt/portal/video/.

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Alexandre Mateus is a doctoral student in the ICTI Engineering and Public Policy program. He holds an undergraduate degree in computer engineering, with a major in artificial intelligence, and a master of science in engineering policy and management of technology, both from the Instituto Superior Técnico, in Lisbon. His professional goals are to work on challenging projects that will contribute to policy-making.

“I am concluding the first phase of my project which was looking at issues related to violations of copyright on the Internet, mainly related to peer-to-peer,” explains Mateus. He selected Illinois University and its 6,500 students to conduct the study. “We designed the process of data collection,” he says, “but we didn’t collect [the data] because in the U.S. there is an organization called Institutional Review Board (a committee that has been formally designated to approve, monitor, and review biomedical and behavioral research involving humans with the aim to protect the rights and welfare of the research subjects) that must approve the research.”

Mateus emphasizes that the main findings were that “many people download pirated content, and there are no geographical, social or other relevant differences; downloads are made mainly during the day, when the persons are active; the activity rises around 10 a.m. and then around 10 p.m. begins to fall.” According to Mateus, “one of the problems that took us to the pirated content was the fact that the industry didn’t adapt the technology.” In light of these findings, Mateus is preparing to study the policy implications of legal business of one or two technologies that are being discussed and that are proposed to facilitate distribution of content online. However, he thinks that those “proposals are designed in terms of engineering, but not in terms of policies: regulation, law, market competition, among many others.”

What is a Ph.D.?
“A Ph.D. is a long-distance race”, says Mateus, “which takes a long time to complete, so we must be prepared to reach the middle and think that this never ends, but we have to continue and think that at the same time we have the opportunity to make very interesting research.

“Carnegie Mellon University has the best Department of Engineering and Public Policy.”
Jaime Cardoso, Assistant Professor at the Faculty of Engineering, University of Porto, visited the Carnegie Mellon campus from July 4th to the 11th to discuss research possibilities for the new call for proposals and partnership opportunities for a semester exchange. Cardoso will be at Carnegie Mellon, under the Faculty Exchange Program, in the Spring 2010.

On June 22nd, the Carnegie Mellon|Portugal Partnership indicated that a second proposal call for research projects will be launched. The first call for research proposals was issued in 2008.

“It’s not the typical research project. It’s really pushed by the problems faced by the Portuguese industry,” says Cardoso. The key to our research goals is finding issues that drive interest from both academia and industry partners to really drive the projects, according to Cardoso.

One idea that Cardoso outlined for increased research involved video surveillance, which combines his personal research interests of machine learning and computer vision. He said the project would encompass research on smart data collection and analysis from surveillance systems, such as face recognition and tracking a figure from one camera to another.

“This ongoing research would be helpful in supermarkets where store owners could better understand client habits and traffic flow to effectively position products,” said Cardoso. He also pointed out that this research project should interest the partnership because of its relevance to areas of ambient intelligence and sensor networks. This kind of research also could result in added value to surveillance company products.

Cardoso also hopes to spend a semester at Carnegie Mellon as a member of a research group and teaching team. He spoke with Eric Xing, associate professor of computer science at Carnegie Mellon, about such a collaboration. “I think it’s a key opportunity for a young researcher like me,” Cardoso says. “This is a top university in the areas I’m interested in.” The collaboration would occur through the Faculty Exchange Program that is run by the Partnership. “The result is above my expectations,” Cardoso said.

“The motivation of people to collaborate on this program is quite strong.”
The demand for greater computer processing speeds is driving manufacturers to pack two, four or more processors into new computer chips, creating headaches for computer programmers that Carnegie Mellon/Portugal researchers believe they can relieve. The result could revolutionize the way software is developed.

Software engineers have long written computer programs sequentially, compiling a list of instructions that follow one after the other, said Jonathan Aldrich, associate professor in Carnegie Mellon’s Institute for Software Research and director of the software engineering minor. But to take full advantage of the new multicore chips, programmers need to find ways to divide up their instructions so that multiple processors can work concurrently to complete a task.

“Concurrent programming is much, much more difficult than sequential programming,” Aldrich said.

Programmers who continue to focus on what each processor is doing and on all of the potential interference that can occur as processors work on problems in parallel quickly become overwhelmed. “It’s just too much information for simple-minded humans to keep in their heads,” he added with a laugh. So Aldrich and Paulo Marques of the University of Coimbra are working together on an ambitious new programming paradigm that they call “concurrency by default.” Rather than worry about the order in which their commands are executed, software engineers using this approach could simply specify in their code what computations need to be performed; the lower level task of assigning tasks for either sequential or concurrent processing would be handled automatically.

“It’s an idea that Paulo and I came up with together,” Aldrich said, noting that both had done extensive research on formal methods for verifying software designs that underlie the “concurrency by default” approach. “This collaborative research is some of the most exciting of my career.” They will present a paper on the new approach at the Onward! 2009 software engineering conference in Orlando, FL, in October.

Aldrich and Marques co-advised Sven Stork, who just finished his first year in the joint Carnegie Mellon|Portugal Computer Science/Software Engineering Ph.D. Program. Aldrich visited Coimbra in July to meet with Marques and also visited Lisbon, where he is beginning collaborative work with Luis Caires at the Universidade Nova de Lisboa.

Francisco Veloso Tapped To Teach in Portugal

Carnegie Mellon University’s Francisco Veloso will spend the 2009 semester teaching at Católica University in Portugal. “I’m going to be doing a lot of innovative work with my students,” said Veloso, an ICTI faculty member and assistant professor in the Department of Engineering and Public Policy at Carnegie Mellon.

Veloso teaches in the areas of technology policy and management, supply chain decisions, and industrial development. He is interested in the development of technology assets and the role of public policy. His work specifically aims at integrating engineering and technology knowledge.

His current work includes a series of studies on how decisions related to technology and innovation (entry in new technologies, adoption of process improvement methods or modular product solutions) affect firm performance throughout the automotive industry.

In 2008, Veloso received a Sloan Industry Studies Fellowship for his research in the automotive sector. The prestigious Sloan Fellowship supports the work of researchers early in their academic careers who are recognized for their exceptional promise to the advancement of knowledge.

A second and more recent area of research involves evaluating and comparing technological capabilities of knowledge-based industries in developing nations. Some of his current research includes analyzing the software industry in China, India and Brazil.

Veloso holds a B.S. in physics engineering from the Instituto Superior Técnico, an M.S. in technology management from the Instituto Superior de Economia e Gestão, and a Ph.D. in technology, management and policy from the Massachusetts Institute of Technology.
The first Ph.D. in Engineering and Public Policy in Portugal

Pedro Ferreira is an Assistant Professor at the Electrical and Computer Engineering Department at Instituto Superior Técnico, Portugal, and a Visiting Professor at the Heinz College, Carnegie Mellon University.

Part of the Carnegie Mellon|Portugal Partnership is responsible for the Ph.D. program in Engineering and Public Policy (EPP), which deals with issues related to telecommunications and energy policies. These are "two industries organized on a network where there are many spill over’s", says Pedro Ferreira.

The Ph.D. program in EPP began last year with five students: Alexandre Mateus (Portuguese, copyright and regulation), Rathapon Saruthirathanaworakun (Thai, management of spectrum), Rebecca Bea Mayer (American, universal service), Brandon Keith Mauch (American, integration of wind energy and the energy distribution network), Patrick Kwadwo Agyapong (Ghanaians, use of broadband in schools and potential use in general). In the next academic year, 2009/2010, three new students will enter the program: Miguel Matos (Portuguese, targeted regulation), Colleen Angela Horin (American, integration of renewable energy in the energy distribution network) and Moinul Zaber (Bangladesh, social networks). Ferreira makes a positive assessment: "The balance of the first year was very interesting and we have been fortunate to have the best students."

Ferreira comments that the energy sector must prioritize the integration of renewable energy in the energy distribution network, saying, "for example Portugal is very interested in the energy of wind and waves, while in the U.S. there are other interests." Moreover, he says that there must be a "change in consumer habits, and therefore there is an entire work to do in the level of social science and marketing that needs to be done to enable consumers to buy more efficiently."

The telecommunication area has been the most in demand by students and by faculty. Here, "we have been looking at several issues, all related to public policies: universal service (for example, does telecommunication reach all people in a nation? How?); regulation for the next generation networks; and many other issues."

Another area that is under investigation is the question of regulation and new technology.

Ferreira explains that regulation may be neutral, applying to what already exists, or may change because the technology is new. In this area, "the attitude of the operators is that they need to have some return on investment they made, so if we open networks in which everyone can compete, the attractiveness for operators in terms of investment will decrease", says Ferreira. Another aspect under review is: "How can the spectrum be used more efficiently, particularly how can operators sublet the space that is not being used?"

"The Carnegie Mellon|Portugal Partnership will be assessed at the end of five years, but in 10 years will bring great results."

"All these projects are worked in partnership with Portugal Telecom, Vodafone and ANACOM (regulator, supervisor and representative of the communications sector in Portugal)", Ferreira explains.

A Ph.D. student in EPP program could, in future, act in large companies and consulting firms, state agencies, or in academia. "While responsible for the PhD in EPP, my goal is to have graduates, co-author papers with faculty at Carnegie Mellon and Portugal, publish in the best journals", Ferreira reveals. "The goal is to create information for an informed decision in public policy and business management."

Ed Schlesinger wants to see:

“A strong web of connections between Portuguese institutions and Carnegie Mellon”

T.E. (Ed) Schlesinger, department head, ECE at Carnegie Mellon University, was in Portugal on July 27-28, 2009 to visit FEUP, INESC Porto, ISR, IST, INESC, and IT. When Schlesinger visited FEUP, his goal was "to strength the collaboration with Universidade do Porto, understand the activities that are being taken, to be able to go back to my faculty and say: look! They are really strong partners and we should work together to develop programs". Schlesinger added, "I want to see a strong web of connections. Not just two or three projects, but many projects with many different flavors". After the visit he concluded that "they are clearly doing good work", and now "I need to encourage my faculty to find connections and extend invitations to some of the faculty to spend time at Carnegie Mellon as well". Schlesinger said that the most important thing is relationship building, because from that relationship emerges good research projects, and students will be highly trained". About the future of this relationship, Schlesinger said, "I think that it has already been reasonably successful and we would like to accelerate it to make it even stronger", and "I want a real dynamic web of interactions that lasts for many years, many generations".
Rajkumar and Ilic Address Innovation in Porto


Rajkumar, Professor of Electrical and Computer Engineering at Carnegie Mellon University and Co-Director of General Motors-Carnegie Mellon Information Technology Collaborative Research Lab addressed the July 13th plenary session on “Critical Infrastructures and the need for S&T based Innovation.” Also attending the session were Alain Pompidou, President of the French Academy of Technology and Charles Wessner, Director of the USA National Academy Program on Technology, Innovation, and Entrepreneurship and advisor to the Obama administration. The session was chaired by Belmiro de Azevedo, SONAE SGPS, Portugal, and William Nuttal, Judge Business School, University of Cambridge.

Rajkumar outlined ideas on “Smart Cyber-Physical Infrastructures: The next technology revolution.” He presented cyber-physical systems as a way to reduce energy costs and talked about future technological challenges such as the construction of sustainable buildings, the creation of support systems for the disabled in the workplace or home, global access to medicine, the reduction of testing, time and costs of developing complex systems, the distribution of electricity, and permanent high yield agriculture.

Marija Ilic, Professor of Electrical and Computing Engineering and Public Policy, participated in the July 14th plenary session entitled “Looking at Urban Environments: Greening the city with knowledge” with Will Wyn, Former Mayor of the City of Austin, Texas, Paulo Ferrão, Instituto Superior Técnico, and João Peças Lopes, Director of INESC Porto. The session was chaired by Marina van Geenhuizen, Faculty of Technology, Policy and Management, Delft University of Technology and Eduardo de Oliveira Fernandes, Coordinator of the Sustainable Energy Systems Area at the Faculty of Engineering of University of Porto. Marija Ilic spoke on “The Role of Dynamic Monitoring and Decision Systems for Enabling Adaptive Urban Consumption.”

Ilic emphasized the importance of rethinking how we plan, rebuild and operate an infrastructure and added that it is necessary to firm up “the concepts, the algorithms and necessary technology transfer.”

Fernando De la Torre Gives a Seminar in Lisbon

Entitled “Learning optimal representations for human sensing,” the Seminar was held on July 6, 2009, at ISR, in Lisbon, Portugal.

Given his extensive experience in projects involving human sensing using video and other sensors, set scenarios were discussed towards widening the cooperation in current projects involving other faculty, and future joint proposals. Fernando De la Torre is a Research Assistant Professor from the Robotics Institute at Carnegie Mellon University. De la Torre’s research interests include computer vision and machine learning. In particular, he is interested in face analysis, optimization and component analysis methods, and its applications to human sensing. De la Torre is also coadvising Carnegie Mellon|Portugal PhD student Ricardo Cabral, with João Costeira and Alexandre Bernardino. During his visit, De la Torre discussed research lines to pursue leading to the definition of the PhD thesis.

Next Newsletter
The next monthly newsletter will feature an article about the Program Statistics, as well as an article about the LTI Workshop and PT Security Lab.