Program Directors Report

A Progress Report

José M. F. Moura
ICTI@CMU

João Barros
ICTI@Portugal
A Time Line

2005:
- Discussions and Meeting at Ministry Sc., Tech., Higher Educ.

2006:
- Jan 31: Visit to CMU of Secr. State Sc., Tech, Higher Ed.
- Mar 10: Signature of MoU, Prime Minister, Minister, Secr. St., FCT Pr., CMU Provost, Dean
- May 24-26: visit to Portugal of CMU Evaluation Com.
  - Several Univ., Portugal Telecom, Critical Software
- Jun 22: Portugal visit to CMU
- Jul 24: Portugal Workshop (Aveiro)
- Oct 27: Contract signing (Aveiro) Prime Minister, Minister, Secr. St., Pr. FCT, CMU Pr., Dean

2007
- March: Director ICTI@Portugal appointed
- Fall: start of Educational Programs
  - Four Professional Masters Programs start (MSE, MHCI, MSIT, MSIN)
  - PhD in Math, LTI, TCE
  - Research projects with companies
2008:
- Fall class (101 students)
- Four Professional Masters (MSE, MHCI, MSIT, MSIN)
- PhD in Math, TCE, ECE, CS (including Software Engineering), LTI, EPP
- New PhD in EPP
- Joint projects with companies
- New postdoctoral program
- Call for research projects (July 30 – October 7)
Goals of the Program

- **Internationalization**
- **Seeds of change**
- **Highly educated professionals (post-licenciatura)**
- **Recruiting best candidates (graduate students, faculty, ...)**
- **Collaboration (between Universities, Research Institutes)**

**Areas of interest:**
- Information and Communication Technologies
  - Telecom networks, SE, Security, HCI, LTI
  - Critical infrastructures and risk assessment
  - Technology change and entrepreneurship
  - Basic Sciences: Applied math

**Companies**
Partners

- Research and Development
  - Ministry of Sc., Tech., Higher Education
  - Foundation Sc. & Technology

- Universities
  - Universidade de Lisboa
  - Instituto Superior Técnico
  - Universidade Católica Portuguesa
  - Universidade Nova de Lisboa
  - Universidade de Aveiro
  - Universidade de Coimbra
  - Universidade da Madeira
  - Universidade do Minho
  - Universidade do Porto
  - Carnegie Mellon University

- Corporate Sponsors
  - Portugal Telecom
  - Nokia Siemens Networks
  - NovaBase
  - Critical Software
  - Telecom Cluster (15 companies)
  - 30 additional companies

- Regional Government Madeira
Educational Programs

- Professional Masters
  - Computer Science
    - Software Engineering
    - Master in Human Computer Interaction
  - Carnegie Institute of Technology
    - Information Networking
    - Information Technology and Information Security
- PhD
  - Carnegie Institute of Technology
    - Electrical and Computer Engineering
    - Engineering and Public Policy
  - School of Computer Science
    - Language Technologies Institute
    - Software Engineering
    - Computer Science
  - Mellon College of Science
    - Mathematics
  - Carnegie Institute of Technology, Heinz College, College of Humanities & Social Science
    - Technological Change and Entrepreneurship
      - Engineering and Public Policy, Social & Decision Sciences, Heinz
How Does it Work: PhD Programs

- **Dual Degrees PhD in Focus Areas:**
  - Two degrees: CMU and Partner University
  - All degree requirements of each University satisfied
  - Departments agree how to fulfill requirements
  - Time at CMU (40%) and time in Portugal (60%)
  - Two advisors
  - Admissions: by each Department or Unit

- **Requirements for PhD:**
  - Courses: some at CMU, some in Portugal, breadth
  - Advisors: at least one at CMU and one in Port. University
  - Thesis defense either place, by convenience
  - Remain CMU students through Program, regardless residence
  - Admissions: by each (CMU and by Partner University)
<table>
<thead>
<tr>
<th>Degree CMU</th>
<th>Dep CMU</th>
<th>College CMU</th>
<th>Degree Port.</th>
<th>Dep. Port.</th>
<th>College Port.</th>
<th>Univ. Port.</th>
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<tbody>
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<td>EPP</td>
<td>EPP</td>
<td>CIT</td>
<td>EPP</td>
<td>ECE</td>
<td>IST</td>
<td>UTL</td>
</tr>
<tr>
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<td>(a)</td>
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<tr>
<td>CS</td>
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<td>SCS</td>
<td>CS</td>
<td>(b)</td>
<td>(b)</td>
<td>(b)</td>
</tr>
<tr>
<td>SE</td>
<td>ISRI</td>
<td>SCS</td>
<td>CS</td>
<td>Informática</td>
<td>FCT</td>
<td>UC</td>
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<tr>
<td>LTI</td>
<td>LTI</td>
<td>SCS</td>
<td>EEC/Eng. Inf.</td>
<td>DEEC/DEIC</td>
<td>IST</td>
<td>UTL</td>
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<tr>
<td>Math</td>
<td>Math</td>
<td>MCS</td>
<td>Math</td>
<td>Math</td>
<td>(c)</td>
<td>(c)</td>
</tr>
</tbody>
</table>

(a) = Departments/Colleges/Universities involved in ECE PhD Dual degree in Portugal: 5 Universities involved – IST, UL, UP, UA, UC; and the following Departments: DEEC IST, DI FC UL, DEEC FCT UC, UA, FEUP

(b) = Departments/Colleges. Universities involved in CS PhD dual degree: 7 Universities involved – IST, UL, UNL, UC, UP, UMníh, UM

(c) = Departments and Universities involved in the Math PhD dual degree: Departments of Mathematics at: IST; UL; UNL
How Does it Work: MSc Programs

- **Dual Degrees Professional Masters:** 4 semesters Fall to Fall
- **Four Areas: New programs in Portugal**
  - Master of Software Engineering (Coimbra and ISRI)
  - Master of Science in Information Networking (Aveiro and INI)
  - Master of Science in Information Security (Lisboa and INI)
  - Master in Human Computer Interaction (Madeira and HCII)
- **Two degrees: CMU and Partner University**
  - All CMU degree requirements satisfied
- **Project component:**
  - Designed together with companies
  - Some is one year long
- **Admissions: by CMU and Partner University**
  - Students with professional experience
  - Interdisciplinary students (e.g., HCI CS+Design+Psychology)
- **Format (dependent on specific program):**
  - Courses: some at CMU, some in Portugal
  - Distance learning
  - Some one semester at CMU
How Does it Work

- **CMU degree**: satisfy CMU requirements
- **Partner University Degree**: satisfy Partner requirements
- **Accredited courses**:
  - Courses accepted to satisfy requirements
  - Cross listed at CMU and partner University
  - Same stringent process of evaluation by Academic Unit, College
  - Transcript will not show where physically taken
- **Faculty**:
  - One semester long stays at CMU
  - Co-teaching courses
  - Faculty evaluation at end of the year
  - Multiple short-term visits
- **Joint advising**: two advisors
- **Student recruitment**: same evaluation
- **Faculty and post-docs recruiting**:
  - International searches
Virtual Institute: two poles

ICTI@CMU
- José M. F. Moura (Director)
- Lori Spears (Associate Director)
- Francisco Veloso (Area Coordinator for EPP, Math, and TCE)
- Peter Steenkiste (Area Coordinator for CS and ECE)
- Nicole Hillard-Hudson (Assistant to the Director)
- Ann Shields Demanski (Events Coordinator)
- Matthew Coley (Business Manager)

ICTI@Portugal
- João Barros (Director)
- Carlos Freire (Executive Director)
- Nuno Nunes & Diogo Gomes (Scientific Directors)
- Silvia Ribeiro (Executive Secretary)
- Sanja Sontor (Inf. Officer and Event Coordinator)
- Alexandra Vieira (Communication Officer)
- António Temes (Executive Thematic Area Coordinator)
External Review Committee

- Evaluates ICTI activities and CMU|Portugal Program

- Reports directly to FCT President, not to ICTI

- Members
  - Sir John O'Reilly, Vice-Chancellor of Cranfield University, United Kingdom, Chairperson
  - Joel Moses, Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology
  - Tariq Durrani, University of Strathclyde, Glasgow, Scotland, United Kingdom
  - David Audretsch, Indiana University
  - Luigia Aiello, Università di Roma, La Sapienza, Rome, Italy
Board of Directors

- Meets twice per year

- Members
  - João Sentieiro, President of the Fundação de Ciência e Tecnologia (FCT), Chairperson
  - Jared L. Cohon, President of Carnegie Mellon University
  - Pradeep Khosla, Dean of the College of Engineering (CIT) at Carnegie Mellon
  - Luís Magalhães, President of UMIC, representative of the Portuguese Minister of Science, Technology and Higher Education
  - Alfredo Baptista, Vice-President of Portugal Comunicações, representative of PT Group to the Board of Directors
  - José M. F. Moura, Director of ICTI@Carnegie Mellon and of the Carnegie Mellon|Portugal program at Carnegie Mellon
  - João Barros, Director of ICTI@Portugal and of the Carnegie Mellon|Portugal program in Portugal
Portugal Team: PhD Principal Investigators

- João Barros, Director CMU-Portugal Program, ICTI@Portugal
  - Electrical and Computer Engineering
    - João Costeira, Instituto Superior Técnico
    - Nuno Borges de Carvalho, Univ. de Aveiro
    - José Silva Matos, FEUP
    - Aurélio Campilho, Univ. do Porto
  - Computer Science
    - Paulo Veríssimo, Univ. de Lisboa
    - Luís Caires, Univ. Nova de Lisboa
    - Luís Moura e Silva, Univ. de Coimbra
    - Fernando Silva, Univ. do Porto
    - Ricardo Machado, Univ. do Minho
    - José Luís Oliveira, Univ de Aveiro
    - Arlindo Oliveira, IST
  - Mathematics
    - José Matias, Instituto Superior Técnico
    - Ana Barroso, Univ. de Lisboa
    - Luísa Mascarenhas, Univ. Nova de Lisboa
  - Language Technology
    - Isabel Trancoso, Instituto Superior Técnico
  - Technological Change and Innovation
    - Rui Baptista, Instituto Superior Técnico
    - Pedro Oliveira, Univ. Católica Portuguesa
  - Engineering and Public Policy
    - Pedro Ferreira, Instituto Superior Técnico

- Information and Communication Technologies Institute
- Carnegie Mellon - PORTUGAL
  - AN INTERNATIONAL PARTNERSHIP
Portugal Team: MSc Coordinators

■ **Information Networking**
  - Nuno Borges Carvalho, Univ de Aveiro, nbcarvalho@ua.pt

■ **Information Security**
  - Paulo Veríssimo, Univ de Lisboa, pjv@di.fc.ul.pt

■ **Software Engineering**
  - João Gabriel Silva, Univ de Coimbra, jgabriel@dei.uc.pt
  - Paulo Marques

■ **Human Computer Interaction**
  - Nuno Jardim Nunes, Univ da Madeira, njn@uma.pt
# Key Statistics

<table>
<thead>
<tr>
<th>Program</th>
<th>Students 07-08</th>
<th>Students 08-09</th>
<th>Post-docs 08-09</th>
<th>Total Enrolment</th>
<th>International Students</th>
<th>New Faculty Recruited</th>
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<td>TCE PhD</td>
<td>6</td>
<td>5</td>
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<td>11</td>
<td>3</td>
<td>2 Ten. Track Fac. IST 1 Research Fac. IST 2 Ten. Track UCP 2 Research Fac. UCP</td>
<td>IST-UTL FCEE-UCP Program</td>
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<td>ECE PhD</td>
<td>1</td>
<td>9</td>
<td>9*</td>
<td>11</td>
<td>7</td>
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<td>3*</td>
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<td>3</td>
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<td>-</td>
<td>18</td>
<td>8</td>
<td>5 Faculty</td>
<td>11 different country apps</td>
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<td>-</td>
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<td>0</td>
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<tr>
<td>MSIN (UA)</td>
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<td>-</td>
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<td>1 Faculty</td>
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<td>SUBTOTAL</td>
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<td>-</td>
<td>66</td>
<td>12</td>
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<td>TOTAL</td>
<td>29</td>
<td>71</td>
<td>2</td>
<td>101</td>
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Class of 2009-2010

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<td>ECE PhD</td>
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<td><strong>SUBTOTAL</strong></td>
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<th>Class of 2009-2010</th>
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<tr>
<td>MHCI (UM)</td>
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<tr>
<td>MSIT-IS (UL)</td>
<td>12</td>
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<tr>
<td>MSIN (UA)</td>
<td>2</td>
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<tr>
<td><strong>SUBTOTAL</strong></td>
<td><strong>43</strong></td>
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**Total Enrollment: 63**
## Key Statistics

<table>
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<th>Category</th>
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<td>Partner Universities in Portugal</td>
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<tr>
<td>Faculty Recruited</td>
<td>33</td>
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<tr>
<td>International Faculty Recruited</td>
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<tr>
<td>Courses Taught (and Vetted)</td>
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<td>PhD Dual Degree Programs</td>
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<tr>
<td>Professional Masters Dual Degree Programs</td>
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<td>Students in Fall 2008</td>
<td>101</td>
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<tr>
<td>PhD Students (including Post-docs)</td>
<td>52</td>
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<td>International Students</td>
<td>45</td>
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<td>Companies Financial Supporters</td>
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<td>Students Supported by Companies</td>
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<tr>
<td>Countries Represented by Student Body</td>
<td>18</td>
</tr>
</tbody>
</table>

- Portugal Telecom
- Novabase
- Critical Software
- Anturio SW
- The Resource Group
- Portugal Telecom
- Microfil
- CGD
- Como
- Produsco
- Open University
- Accenture
- Chile
- China
- Italy
- Thailand
- Bosnia Herzegovina
- Ghana
- Brazil
- Iran
- Serbia
- Spain
- Costa Rica
- Ukraine
- India
- Germany
- Portugal
- United States
- London
- Canada
MHCI Madeira Successes

- Students admissions: HCI Institute selected and ranked their applicants to Pittsburgh Program, with Madeira offered admissions to Madeira Program to the six top selected applicants of Pittsburgh Program, four of the six accepted and chose to enroll in the MHCI Madeira. Lost 7 students offered admissions: 2 to CMU Program, others to Stanford, MIT, and Berkeley.

- Rejected 6 from Taiwan (low verbal) (one went to MIT)

- International class

- Faculty recruited: 5

- Generated 2.2 M€ of proposals last year

- Summer Academy in HCI
Call for Research Proposals

- **RP1**: New Generation Dependable Trusted Networks & Telecommunications Policy (NGN)
- **RP2**: Cyber-Physical Systems and Intelligent SCADAs for Networked Industries (CPS)
- **RP3**: Software Engineering for High Performance and Adaptive Systems (SE)
- **RP4**: Humans and Machines (HuMach)
- **RP5**: Human Capital and Entrepreneurial Dynamics in High Tech industries (ETech).
Funded Call for Research Proposals

- CPS 46: Vital Responder: Monitoring Stress among First Responder Professionals
  - CMU PI: Priya Narasimhan
  - Portugal PI: João Barros

- Etech 36: Human Capital, Entrepreneurial Careers and Knowledge Based Entrepreneurship
  - CMU PI: Steven Klepper
  - Portugal PI: Rui Baptista, Frederick Lehman, Clara C. Raposo

- HuMach 04: SINAIS - Sustainable Interaction with social Networks, context Awareness and Innovative Services
  - CMU PI: Anind Dey
  - Portugal PI: Duarte Nuno Jardim Nunes

- HuMach 39: PT-STAR - Speech Translation Advanced Research to and from Portuguese
  - CMU PI: Alan Black
  - Portugal PI: Maria Luísa Torres Ribeiro Marques da Silva Coheur

- HuMach 53: REAP.PT
  - CMU PI: Maxine Eskenazi
  - Portugal PI: Nuno João Neves Mamede

- NGN 44: Certified Interfaces for Integrity and Security in Extensible Web-based Applications
  - CMU PI: Frank Pfenning
  - Portugal PI: Luís Manuel Marques da Costa Caires

- NGN 52: DRIVE-IN - Distributed Routing and Infotainment through VEhiculaer Inter-Networking
  - CMU PI: Ozan Tonguz
  - Portugal PI: Michel Celestino Paiva Ferreira

  - CMU PI: Norman Sedah
  - Portugal PI: Vassilis Kostakos
## Faculty Recruitment: 2007

<table>
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<tr>
<th>Institution</th>
<th>Program</th>
<th>Number</th>
<th>Names</th>
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<tbody>
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<td>FCUL</td>
<td>ECE/CS</td>
<td>4</td>
<td>Alysson Bessani (Brazil)</td>
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<tr>
<td></td>
<td>MSIN</td>
<td>Replacement</td>
<td>Fabricio Silva (Brazil)</td>
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<tr>
<td></td>
<td>MSIT</td>
<td></td>
<td>Hans Reiser (Germany)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Paulo Sousa</td>
</tr>
<tr>
<td>FCCEE-Católica</td>
<td>TCE</td>
<td>1</td>
<td>Irina Cojuharenco (Moldova)</td>
</tr>
<tr>
<td>University of Aveiro</td>
<td>MSIN</td>
<td>1</td>
<td>Francisco Fontes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>? Replacement</td>
<td>Some replacement Faculty</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 TA’s</td>
<td>4 Teaching Assistant</td>
</tr>
<tr>
<td>University of Madeira</td>
<td>MHCI</td>
<td>4</td>
<td>Ian Oakley (foreign)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Monchu Chen (foreign)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vassilis Kostakos (foreign)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nestor Catano (foreign)</td>
</tr>
<tr>
<td>University of Coimbra</td>
<td>MSE</td>
<td>2</td>
<td>Alberto Moraglio (Italy)</td>
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<tr>
<td></td>
<td></td>
<td>Replacement</td>
<td>Luis Paquete</td>
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<tr>
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<td>8 TA’s</td>
<td>8 Teaching Assistants</td>
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# Faculty Recruitment: 2008

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<tr>
<th>Institution</th>
<th>Program</th>
<th>Number</th>
<th>Names</th>
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</thead>
</table>
| FCUL                 | MSIN    | 2 Replacement | Joaquim Ferreira  
|                      | MSIT    |             | Marcelo Pasin (Brasil)                                      |
|                      |         |             |                                                            |
| IST                  | ECE     | 2          | Antonio Pedro Aguiar  
|                      |         |             | Gustavo Carneiro (Brazil)                                   |
|                      |         | 1 Researcher |                                                            |
| IST                  | TCE     | 2 Faculty  | João Leitão  
|                      |         |             | António M. Amaral                                          |
|                      |         | 1 Researcher | Murat Karaöz (foreign)                                     |
| FCEE-Católica        | TCE     | 1 Faculty  | Andrei Villarroel (Bolivia)                                 |
|                      |         | 2 Researchers | Ana Costa  
|                      |         |             | Antonino Vaccaro (Italy)                                    |
| University of Madeira| MHCI    | 1          | Valentina Nisi (Italy)                                      |
| University of Coimbra| MSE     | 2          | Names not indicated because contracts were being finalized |
| University of Aveiro | MSIN    | 3 (Part time) | José Moreira  
|                      |         | 4 replacement  | Paulo Pedreiras  
|                      |         | (part time)    | Paulo Salvador                                              |
|                      |         |             |                | Helena Moreira  
|                      |         |             | Jonathan Rodriguez (foreign)                               |
|                      |         |             |                | José Joaquim Ferreira                                      |
|                      |         |             |                | Susana Isabel Sargento                                      |
|                      |         |             |                | 5 TA’s                                                      |

Carnegie Mellon
Building Strong Consortia

- **Dual degrees and joint degrees**
  - Math: IST, FC UL, FCT UNL
  - TCE: FCEE UCP and IST

- **Coordinated degree programs**
  - ECE: 5 Departments – IST, FC UL, U Aveiro, FE UP, FCT UC
  - CS: 7 Departments – IST, FC UL, FCT UC, FCT UNL, U Minho, U Madeira, FC UP

- **Virtual campus**

- **Research teams:**
  - Call for Proposals
    - 2 Teams of Portugal Universities
    - 1 Team from CMU
    - 1 Company
Virtual Campus: Goal

- Offer course portfolio that CMU|Portugal students of all Programs can take across various schools and locations in Portugal
- Create opportunity for unique and most relevant learning experience that can have a significant impact on their future careers as professionals and researchers
Virtual Campus at Carnegie Mellon

- **Freedom of choice.**
  - Students at CMU can take any course listed by the registrar
  - Student successfully taking the course will be working towards satisfying degree requirements
  - Decision is made according to broad degree requirements and advisor interaction to fulfill the student learning objectives

- **Undergraduate and graduate courses.**
  - CMU distinguishes only between undergraduate and graduate level
  - Graduate level (usually, with a number 700 or above, e.g., 18-752)
  - Undergraduate (usually, with a number below 600, e.g., 18-450)
  - Courses at the 600 level are mezzanine courses, sometimes they can count towards satisfying a graduate level requirement
Existing Programs

**Masters**
- MHCI - Master in Human Computer Interaction (U. Madeira)
- MSE - Master in Software Engineering (U.Coimbra)
- MSIN - Master of Science in Information Networking (U.Aveiro)
- MSIT:IS – MS in Information Technology – Info Security (U.Lisboa)

**Dual PhDs**
- PhD in Mathematics (Lisbon – UTL, UNL, UL)
- PhD in Computer Science / Electrical & Computer Eng. (National)
- PhD in Language Technology (Lisbon – UTL)
- PhD in Technological Change & Entrepreneurship (Lisbon– UTL, UCP)
- PhD in Engineering and Public Policy (Lisbon - IST)
Existing Virtual Campus Efforts

- **Technological Change and Entrepreneurship**
  - Collaborative effort between IST: UTL and FCEE: UCP
  - Collaborative effort at CMU: EPP, Heinz, SDS, Tepper

- **Engineering and Public Policy**
  - Based at IST – in collaboration with TCE PhD

- **PhD Degree in Mathematics**
  - Joint PhD program organized across 3 participating Portugal schools

- **Initial Efforts in CS/ECE**
  - ECE Courses being offered at IST with local students taken by FCUP PhD Student through video conference
  - Broad set of principles agreed (MoU) by schools at national level for joint PhD initiative
# Technological Change & Entrepreneurship

## Virtual Campus Program Example

<table>
<thead>
<tr>
<th>First Year</th>
<th>1st Semester</th>
<th>Location</th>
<th>2nd Semester</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursework Requirements</td>
<td>Microeconomics [also EPP]</td>
<td>UCP-FCEE</td>
<td>Modeling Firm Decisions &amp; Industrial Competition</td>
<td>UCP-FCEE</td>
</tr>
<tr>
<td></td>
<td>Introduction to Quant. Research Methods [also EPP]</td>
<td>UTL-IST (ISEG teacher)</td>
<td>Quantitative Research Methods [also EPP]</td>
<td>UTL-IST</td>
</tr>
<tr>
<td></td>
<td>Organization Theory</td>
<td>UCP-FCEE</td>
<td>Entrepreneurship Theory</td>
<td>UTL-IST</td>
</tr>
<tr>
<td>Summer Period</td>
<td>Work on Research Paper</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second Year</td>
<td>1st Semester</td>
<td>Location</td>
<td>2nd Semester</td>
<td>Location</td>
</tr>
<tr>
<td>Coursework Requirements</td>
<td>Economics of Technical Change</td>
<td>CMU</td>
<td>Industry Dynamics and Technological Change</td>
<td>CMU</td>
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<td></td>
<td>Concentration Sequence I</td>
<td>CMU</td>
<td>Concentration Sequence</td>
<td>CMU</td>
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<td></td>
<td>Elective</td>
<td>CMU</td>
<td>Elective</td>
<td>CMU</td>
</tr>
</tbody>
</table>
Principles for CMU|Portugal Program

- **Requirements overlap**
  - Program will strive to maximize requirements overlap between CMU and the partners in Portugal to minimize the extra work

- **Cross Registration in Portugal**
  - MS or PhD students can satisfy CMU and Portugal degree requirements by taking courses vetted and offered throughout Portugal
  - Example: Vetted course offered in Aveiro can be taken by any other CMU|Portugal student (and other CMU students if offered by VC), and will contribute to satisfy MSc or PhD degree requirement at CMU for which the course is listed.

- **Vetting Process**
  - Vettable Courses
  - Vetted Courses

- **Teach the teacher model**
  - Have faculty from Portuguese schools become embedded with the class environment at CMU

- **PhD Committee**
  - Establish formal PhD committees in Portugal and CMU as program grow
Success Stories

- Attracted 101 top students, 30 foreign from 12 different countries. This is a significant collection of high level human capital, which will now start returning to the productive sector after receiving world class technical education. Concentrated effort of partnership in ICTs yields unique group to have significant impact in Portugal (and around the world) in the capabilities of universities, firms and the public sector in this area.

- MHCI and the MSE recruited full classes of 15 students
- MHCI recruited four of the six top recruits in the MHCI@CMU Program
- MSE recruited 15 students from Portugal companies. Small companies extended support to several of these students.
- European Universities Association referred to the MHCI and the CMU/Portugal Program as one of the two positive factors that happened at the University of Madeira in their evaluation of the University carried out by request of the Ministry of Science, Technology, and Higher Education.
Success Stories

- **Top level applicants lead to top academic performance**
  - MSE students w/ top notch grades, best performance possible on Studio Project (at CMU)
  - “All I got were outstanding remarks from the mentors. They all say this is the ultimate MSE team. They certainly deserve an A if not an A+ this semester from my perspective, what an impressive group!”
  - Success of ongoing capstone project in the context of the MSE with the industry sponsor exceeded the expectations. Students did very well and their results were of equal if not greater quality than their Pittsburgh peers. The industry sponsors understanding the full potential of the interdisciplinary work this program provides, this is very uncommon in Portugal.
  - Another student from one of the Professional Masters Program was the top student in one of the courses taught simultaneously to CMU classes and two sites in Portugal (total class size exceeded 100).
**Success Stories: PhD Programs**

- PhD Student Admissions: # applicants (70) drawn from all over the World to the ECE dual degree PhD Program and # of applicants to postdoctoral program in Applied Mathematics (over 90)

- Truly integrated doctoral programs across various schools
  - TCE (IST-UTL and FCEE-UCPP) is leading case and has been official recognized by the public educational supervising body (DGES). The program includes an integrated program with courses offered to the students enrolled in the program at both locations, a research seminar series alternating between the schools, and co-supervision of students. The first cohort of students has successfully completed the first year and is now based in Carnegie Mellon
  - Mathematics (UTL, UNL and UL)
  - ECE and CS integrated coordinated programs
Success Stories

- Faculty recruitment: Carnegie Mellon|Portugal recruited 17 new internationally competitive faculty plus 15 others hired to work in related areas. This group, in conjunction with Carnegie Mellon research partners and with the support of 35 top students completing PhD programs in a variety of universities in Portugal, provides a significant boost to the research capabilities of the national university system in the area of ICT.

- Linkage to industry: The CMU|Portugal Program is instilling a radically new level of linkages between university and industry. For the first time there are a set of partner firms that are committing significant financial resources and their best talent to the partnership. Portugal Telecom, Nokia-Siemens and Novabase are leading the way. Overall, 33 employees of 10 firms are participating in masters and PhD programs. Over 30 companies have joined schools across Portugal as partners in the call for projects that has been closed in October. Several others are sponsoring master projects and other research initiatives.
Success Stories

- **New EPP doctoral program launched fall 2008**
- **5 ECE Departments and 7 CS Departments in Portugal have been working together to coordinate their PhD dual degree Programs**
- **Virtual campus:**
  - TCE
  - Math
  - ECE: one student in U Porto taking classes taught at IST
- **Teach the teacher model**
Success Stories: Industry Involvement

- 30 PT MS students
- Usability tests for MEO triple play flagship product conducted in University of Madeira in lab created associated to the MS HCI program.
- “Network-Wide Management” research project supervised by Hyong Kim enables new level of network management at the telecom operator.
- Novabase supports 7 students (to publicly show their commitment, in September 2008, when Novabase had their new headquarters inaugurated, the ceremony included a symbolic act of handing out their “grants” to selected MSE students supported by the company. The ceremony was attended by the Prime Minister, the Minister for Science and Technology and Higher Education, the Minister of Education, the Minister of Economy, among other high-ranking government officials. Faculty members from UC attended the ceremony and the event was covered by the press, which gave a tremendous amount of visibility.
**Success Stories**

**Student Mobility. The mobility of students across the Atlantic has been a success:**

- MHCI students in Pittsburgh in fall 2008 then go back to Madeira.
- MSE students spend Spring semester at CMU working on studio project.
- Four students from the first class of MSIN chose to reside in Pittsburgh in the fall 2008.
- Three students from the first MSIT class and one student from the first MSIN class spent the summer of 2008 in Pittsburgh pursuing their Professional Master’s project supervised by Prof. Hyong Kim.
- The first cohort of TCE PhD students moved from Portugal where they spent the first year taking classes and are now in Pittsburgh taking classes and doing research.
- One CS/SE PhD Student now at Carnegie Mellon goes to Coimbra in spring.
- First year ECE PhD students in IST and MAP-I will move to Pittsburgh in the summer.
Success Stories: Research

- Twenty one proposals submitted to the recent Call for Proposals teaming at least:
  - 42 University groups from Portugal
  - at least 21 teams from CMU
  - 30 companies

- New Research Inst., Univ., Companies, CMU groups

- Shifted focus of Program to make explicit research

- Learning process in Portugal teams:
  - Forced them talking to each other
  - Define research focus and themes

- Interdisciplinary

- Larger teams