

CMU Portugal

Exploring new research frontiers in ICT
towards a global innovation ecosystem

CMU Portugal at a glance

Overview

The Carnegie Mellon Portugal Program (CMU Portugal) is a platform for education, research and innovation that brings together Carnegie Mellon University (CMU) and several Portuguese universities, research institutions and companies. This partnership was launched in 2006, and is split into two phases (phase I: 2006 – 2012; phase II: 2012 -2017). The third phase of the program started in 2018 and will convene through 2030.

Mission

The mission of the Carnegie Mellon Portugal Program is to place Portugal at the forefront of research and technological development in the area of ICT, by promoting an innovation ecosystem with a tight coupling between cutting-edge research, world-class graduate education, and highly innovative companies in the data-driven economy.



CMU Portugal in Numbers (2006–2018)



Education

365

PhD and Masters students enrolled

118

PhD Students admitted

247

Master students admitted

58

Dual Degree PhD graduates

228

Dual Degree Master graduates

41

Undergraduate Internships

68

Faculty Exchanges



Research & Innovation

42

Portuguese Institutions involved

19

CMU Departments

50

Collaborative Research projects

132

Industry Partners

11

Startups created

118

Million \$ of international investment by startups

400

Plus skilled jobs created by startups

CMU Portugal Governance

Program Directors



Rodrigo Rodrigues
National Co-Director
rodrigo@cmuportugal.org



Nuno Nunes
National Co-Director
nnunes@cmuportugal



José Fonseca de Moura
Director at CMU
moura@ece.cmu.edu

Sílvia Castro
Executive Director at Portugal
silvia.castro@cmuportugal.org

Megan Flohr
Associate Director at CMU
mflohr@andrew.cmu.edu

Scientific Directors

Joana Mendonça
Luís Caires
João Paulo Costeira
João Paulo Cunha

IN+/IST-UL
FCT/UNL
ISR/IST/UL
FEUP

José Miguel Urbano
Paulo Marques
Peter Steenkiste

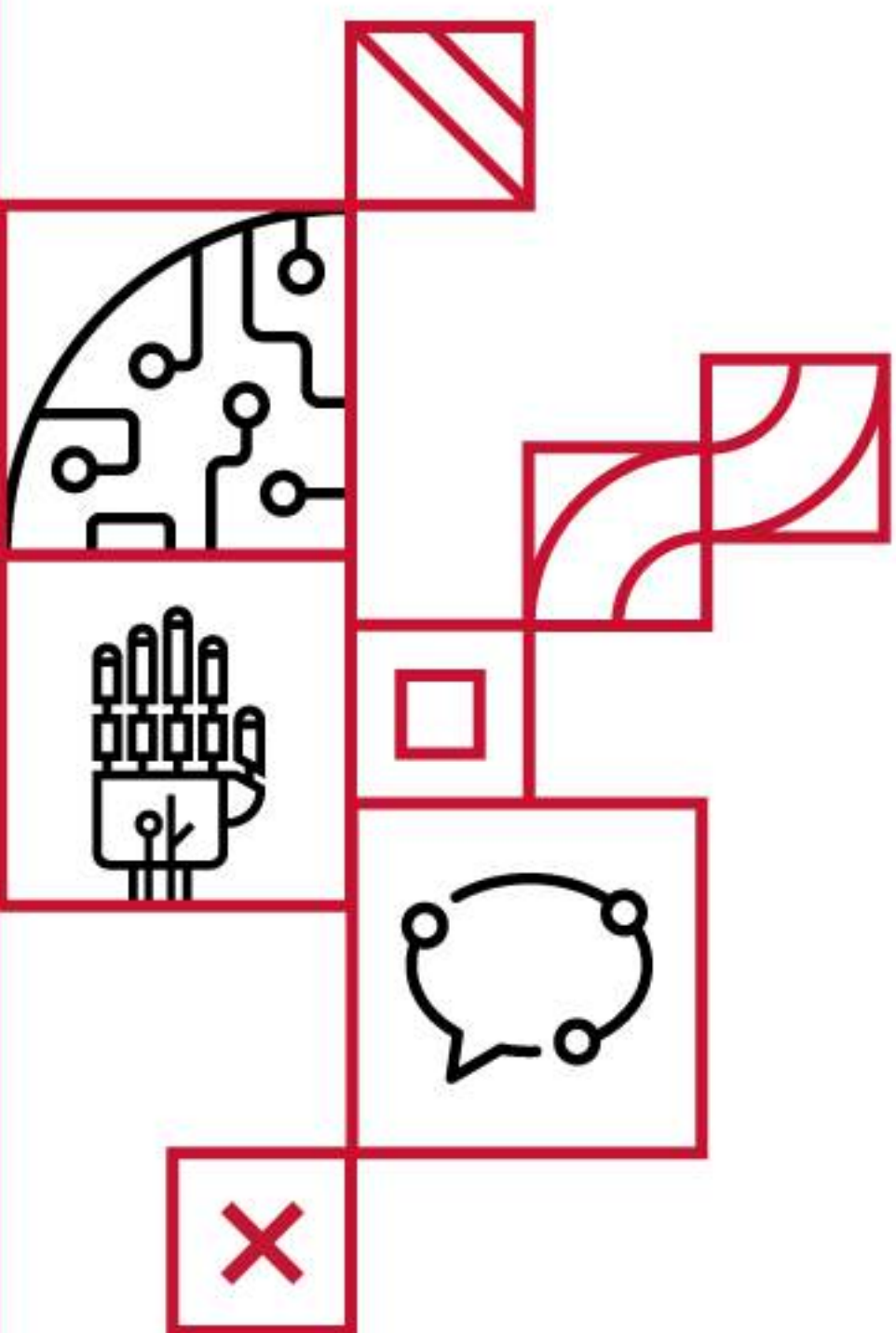
UC
Feedzai
CMU

Industrial Affiliates

Companies committed to actively contributing to the advanced education and research programs of the partnership, and also to increase their competitiveness by investing in R&D, in advanced training of human resources, and in building a highly skilled workforce dedicated to innovation activities.

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CMU Portugal 2006-2017 Phase 1 and Phase 2

A look into the past

Education and Research

**Dual Degree
Ph.D.**
2006-2017

- 117 Number of Admissions
- 50 Number of graduates
 - 16 Electrical Computer Engineering
 - 12 Engineering and Public Policy
 - 10 Tech. Change Entrepreneurship
 - 5 Language Technology
 - 4 Computer Science
 - 2 Applied Mathematics
 - 1 Software Engineering

**Dual Degree
Masters**
2006-2017

- 247 Number of Admissions
- 228 Number of graduates
 - 111 MHCI
 - 46 MSE
 - 34 MSIT-IS
 - 19 MET
 - 14 MSIN
 - 4 MSIT-SE

**Undergraduate
Internship
Program**
Launched in 2014

- 41 Total number of students involved
 - 14 Computer Science Department
 - 12 Electrical and Computer Engineering
 - 4 Robotics Institute
 - 3 Language Technology Institute
 - 8 Other

**Faculty
Exchange**
Launched in 2007

- 68 Total number of faculty involved
 - 19 Electrical and Computer Engineering
 - 13 Institute for Software Research
 - 9 Computer Science Department
 - 6 Human-Computer Interaction Institute
 - 21 Other

**Scientific
Outputs**
2006-2017

- 250 journal papers
- 550 conference papers
- 350 conference presentations
- 30 books or book chapters
- 40 awards

Research projects

1st Phase

2008 Call for Projects

- 10 Projects funded
- Concluded in 2012-2013

2009 Call for Projects

- 15 Projects funded
- Concluded in 2013-2014

2009 Joint Call for Projects with UT Austin

- 3 Projects funded
- Partnership with UT Austin Portugal in Applied Mathematics
- Concluded in 2012-2013

2nd Phase

2013 and 2014 Entrepreneurial Research Initiatives

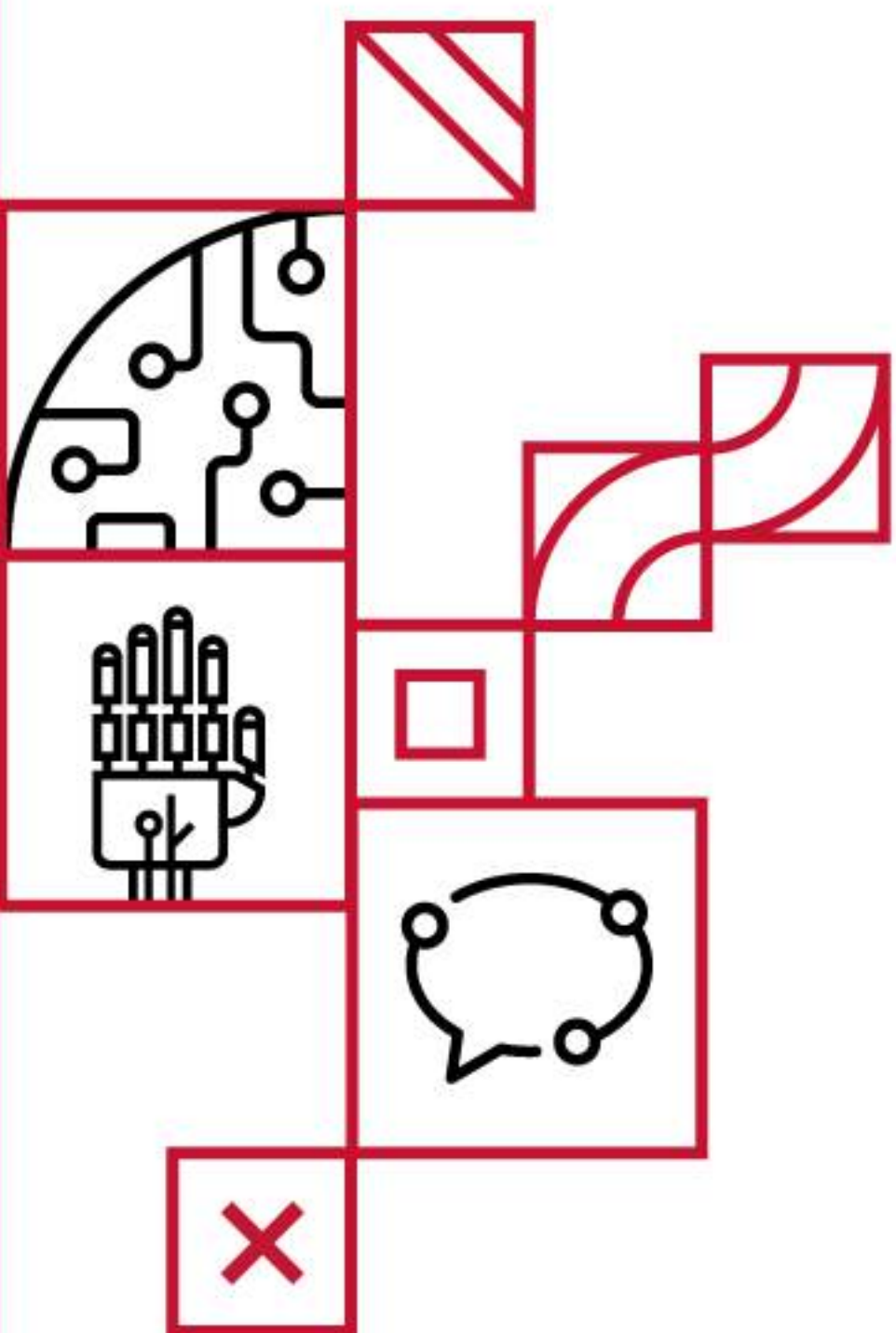
- 12 projects approved
- Integrated activities in research, innovation, advanced education
- with industry collaboration
- for real world impact
- approximately 11.5 million Euros
- four years

2013 Early Bird Projects

- 10 projects funded
- Jumpstart new high-impact initiatives
- emphasis on exploratory research
- approximately 300 thousand Euros
- one year
- two EBPs continued into ERIs in the second call

2017 Call for Exploratory Research Projects

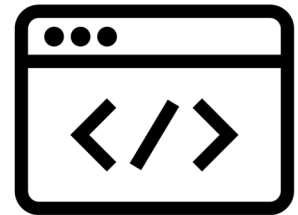
- 8 projects approved
- Identify emerging key strategic areas for a potential third phase
- expected to finance 7-10 awards
- approximately 1.2 million Euros
- one year.



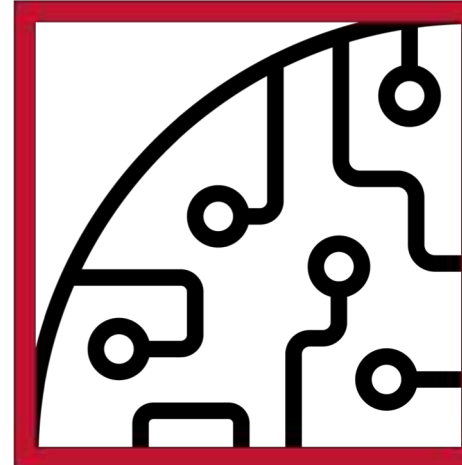
— **CMU Portugal 2018-2023 Phase 3**

A look into the future

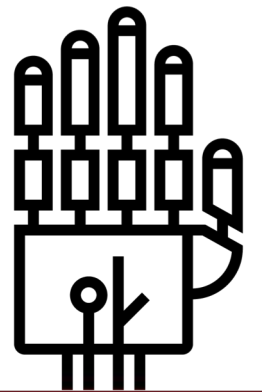
CMU Portugal Program – ICT focus areas



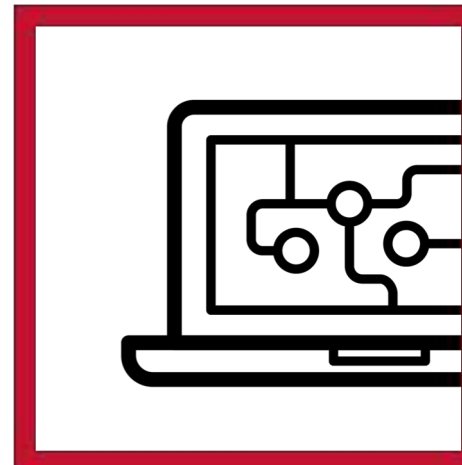
**Software
Engineering**



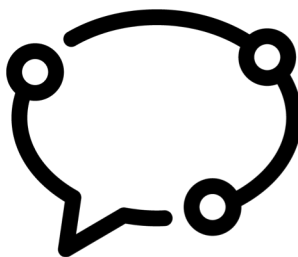
**Data science and
engineering**



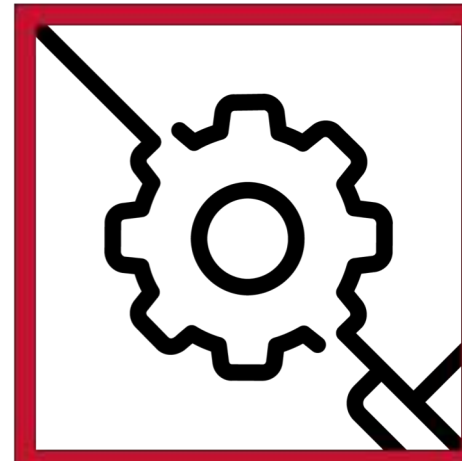
**Autonomy and
Robotics**



**AI and Machine
learning**

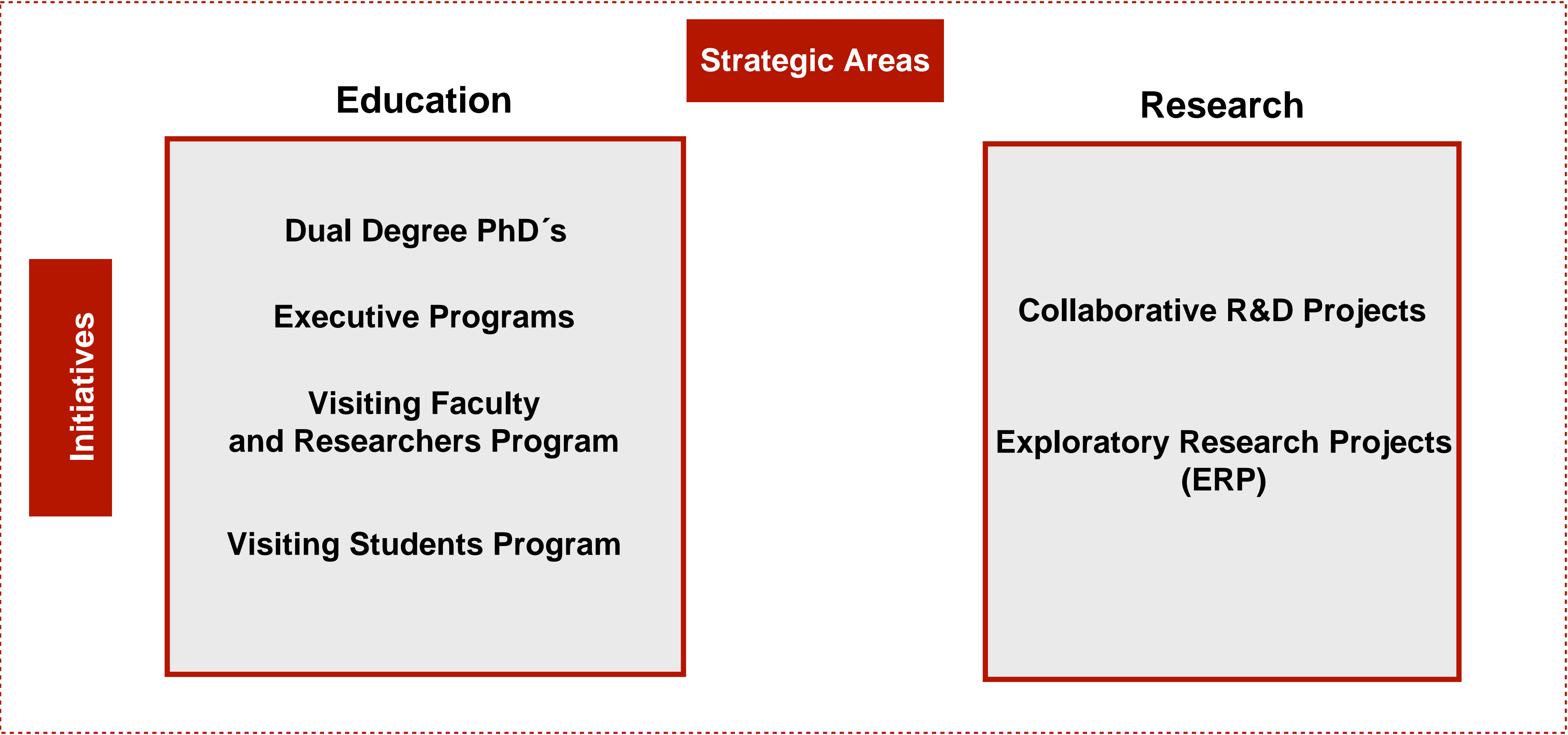


**Language
Technologies**



**Design and
engineering at large**

3rd Phase Initiatives



Portuguese International Collaborative R&D Projects

Strengthen the implementation of entrepreneurship and R&D capabilities as key competences of Portuguese companies, mobilizing their collaboration with worldwide leading institutions to address global markets

Promoted by FCT and ANI under the GoPortugal Initiative



GoPortugal (2018-2030)

Global Science and Technology Partnerships Portugal It aims to promote Portugal's positioning in the World through entrepreneurial development and scientific and economic valorisation of the innovative agenda on "Atlantic Interactions" and attract human resources of recognised international merit to work in Portugal.

FCT Fundação
para a Ciência
e a Tecnologia



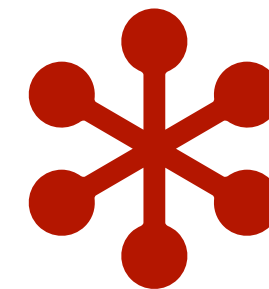
PI PROGRAMA
INTERFACE

Portuguese International Collaborative R&D Projects



Objectives

Alignment with the national and regional Smart Specialization Research and Innovation Strategies
Foster industry-science relationships
Strengthen competitiveness and international integration



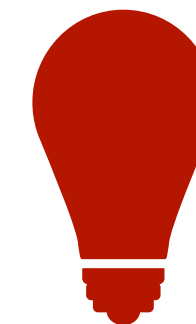
Collaborative consortiums

Projects co-promoted by companies and other entities in the R&I System
Leadership by Portuguese company
At least two R&D centres in Portugal
At least one CMU research team



Funding and deadlines

Total Funding: 5 M€
Number: 2-4 projects
Maximum duration: 36 months
Call open in February 2019



Research Topics

Information and Communication Technologies – addressing problems that are relevant to the industry, with particular emphasis:
Data science and Engineering
Artificial Intelligence and Machine Learning
Autonomy and Mobility
Design in a variety of societal settings and applications



Applications

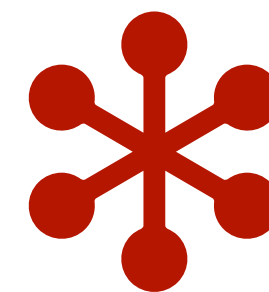
Electronic submission in the Portal “Portugal 2020”
Project description in English.

Exploratory Research Projects (ERP)



Objectives

Bootstrap high-impact potential research activities
High-risk/high-reward
Significant future expansion



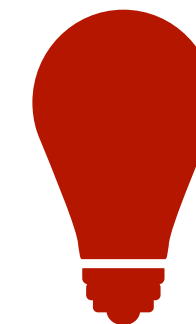
Collaborative consortiums

At least one R&D centre in Portugal
At least one CMU research team
Industry partners is not mandatory but it is beneficial



Funding

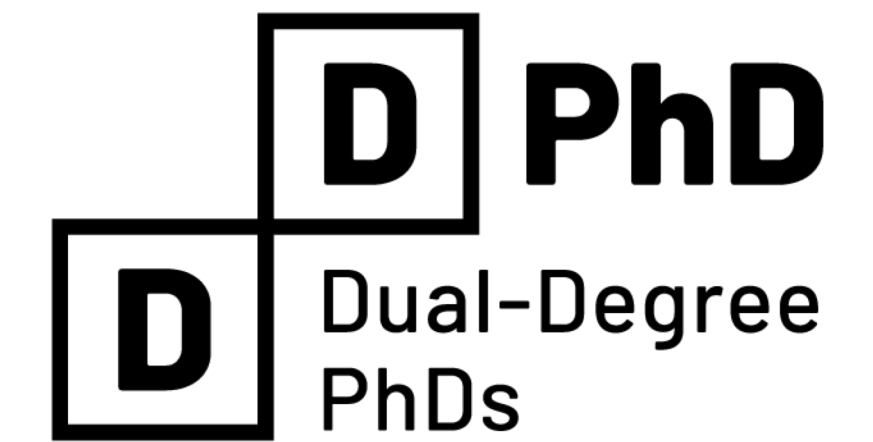
Total Funding: 1 M€
Number: up to 13 projects
Duration: 12 months
Call open early 2019



Research Topics

Information and Communication
Technologies – ICT- with a focus on the
opportunities provided by the data
economy as a driver of growth and
change.

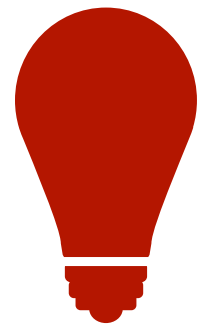
PhD Programs



Objectives

Dual degree Ph.D. programs in selected cutting-edge areas of ICT

Graduates receive dual degrees conferred by Carnegie Mellon and by the affiliated Portuguese University



Research Topics

Computer Science

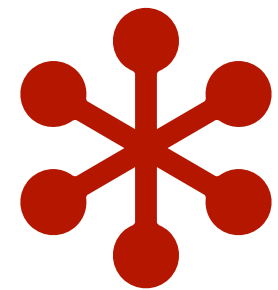
Electrical and Computer Engineering

Engineering and Public Policy

Language Technologies

Robotics

Software Engineering



Collaborative consortiums

Research in Portugal and at CMU

Co-advisors by CMU and Portuguese faculty



Format, deadlines and Funding

6 dual degrees scholarships for 2019/2020 academic year

3 years in Portugal + 2 years at CMU

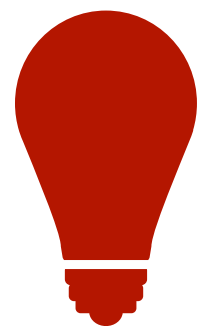
Applications closed on December 31st 2018

Executive Programs



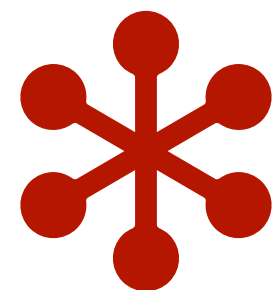
Objectives

Educating and qualifying active agents, aspirants or well established professionals, as well as researchers and academics to address the growing challenges resulting from the integration of technologies into different domains of our society



Research Topics

User Experience Design
Software Engineering
Machine Learning



Collaborative consortiums

At least one University in Portugal
CMU
Industry partners



Formats

2 semesters
Short intensive course (e.g. 2 weeks)
Programs to start on Autumn

Draft proposal for discussion

Executive Program in User Experience Design

Preliminary participant institutions:

- Instituto Superior Técnico
- Carnegie Mellon University

Contact point in Pt:

Nuno Nunes ; nunojnunes@tecnico.ulisboa.pt

Contents	Industry Involvement
<p>The curricular structure of the Executive Program comprehends a total of 5 mandatory (HCI Seminar, Human Centered Research and Evaluation, Interactive Design Studio I and Interactive Design Studio I) and 4 elective courses.</p> <p>Computer Science students and similar should take the curricular unit Software Architecture for User Interfaces, while non-technical students should take the curricular unit User Interfaces Programming. Both units share a common laboratorial component which corresponds to 3 mandatory projects on web development, mobile systems and graphical interfaces. Regarding the optional units, while there are no specific requirements, students are encouraged to develop knowledge and skills outside their main academic background.</p>	<p>The Executive Program in User Experience Design offers many opportunities for industry placement in particular through optional interdisciplinary capstone projects. These projects are structured to cover the end-to-end design process of a product development lifecycle for a novel user-experience.</p> <p>Working with faculty mentors and their industry partners, teams produce user research, product designs and interactive prototypes to improve or design new applications to a partner's existing technology. The project culminates with a presentation of the teams' final prototypes which usually lead to new products or services and/or industry spinoffs.</p>

Draft proposal for discussion

Executive Program in Software Engineering

Preliminary participant institutions:

- Universidade da Beira Interior
- Faculdade de Ciências da Universidade do Porto
- Universidade de Aveiro
- ISCTE-IUL
- Carnegie Mellon University

Contact point in Pt:

Nuno Pombo; ngpombo@di.ubi.pt

Contents	Industry Involvement
<p>The introduction of ICT in different societal areas has, on one hand, created new scenarios and opportunities for such technologies to contribute and thrive, but, on the other, has risen new challenges. Key aspects regard a greater need for fast integration and deployment cycles, and the execution in highly scaled environments, supported by communication networks (often via mobile devices) and virtualization aspects. In this sense, EPSE aims to provide advanced knowledge in concepts associated to:</p> <p>i) Continuous Development/Continuous Integration methodologies, supported by virtualization</p>	<p>and other cloud-based constructs;</p> <p>ii) Interfacing with telecommunication services and infrastructure interfaces for distributed and dynamically scalable applications and services;</p> <p>iii) Security mechanisms and policies.</p> <p>National and international ICT companies based in Portugal seeking to train their key personnel positions.</p>

Draft proposal for discussion

Executive Program in Machine Learning

Preliminary participant institutions:

- Instituto Superior Técnico
- Carnegie Mellon University

Contact point in Pt:

Rodrigo Rodrigues; rodrigo.miragaia.rodrigues@tecnico.ulisboa.pt

Contents	Industry Involvement
<p>The curricular structure of the Executive Program in Machine Learning comprises four mandatory courses and five optional courses.</p> <p>The four mandatory courses cover the essentials of the following areas:</p> <ul style="list-style-type: none">- introduction to machine learning,- statistical learning,- data analysis, and- probability and statistics.	<p>The five optional courses can be chosen from a set of courses that provide students with the ability to study in more depth topics of their interest, ranging from advanced topics in machine learning such as deep learning or reinforcement learning, to related and applied areas.</p>

Visiting Faculty & Researchers



Portuguese Faculty at CMU University



Objectives

Immersion period of Portuguese faculty at Carnegie Mellon University to experience its culture and best practices in the field of research, education and innovation.



Funding

Number: 6 scholarships (€2 245,00/month)

Duration: up to 4 months

Call open from February 4th until March 3rd 2019

CMU Faculty at Portuguese Universities

A similar program is planned to be implemented for CMU Faculty members to be in residence at Portuguese Universities

Visiting Students



Objectives

Extend research opportunities to MSc and PhD students of Portuguese University to participate in research projects and be supervised by researchers at Carnegie Mellon University.

This program aims to encourage and prepare graduate students to pursue research careers within the scientific areas of the dual degree doctoral programs offered by CMU Portugal.



Funding

Number: 8 scholarships (€1710,00/month)

Duration: up to 6 months

Call open from March 4th until April 5th 2019

AI Portugal 2030

Iniciativa Nacional Competencias Digitais, INCoDe.2030
(Portuguese National Initiative on Digital Skills)

AI Portugal 2030

An innovation and growth strategy to foster Artificial Intelligence in Portugal in the European context

Promoted through the *Coordination Office* of INCoDe.2030 Initiative in close cooperation with the Portuguese Science and Technology Foundation (FCT), The Portuguese Innovation Agency (ANI), Ciencia Viva and the Portuguese Agency for Administrative Modernization (AMA)

Draft, 31 January 2019

CMU AI

It's More INTELLIGENT

WATCH VIDEO

RESEARCHERS

STUDENTS

FACULTY

PARTNERS

MOONSHOTS PROJECTS

CMU AI IN ACTION

Machine Learning

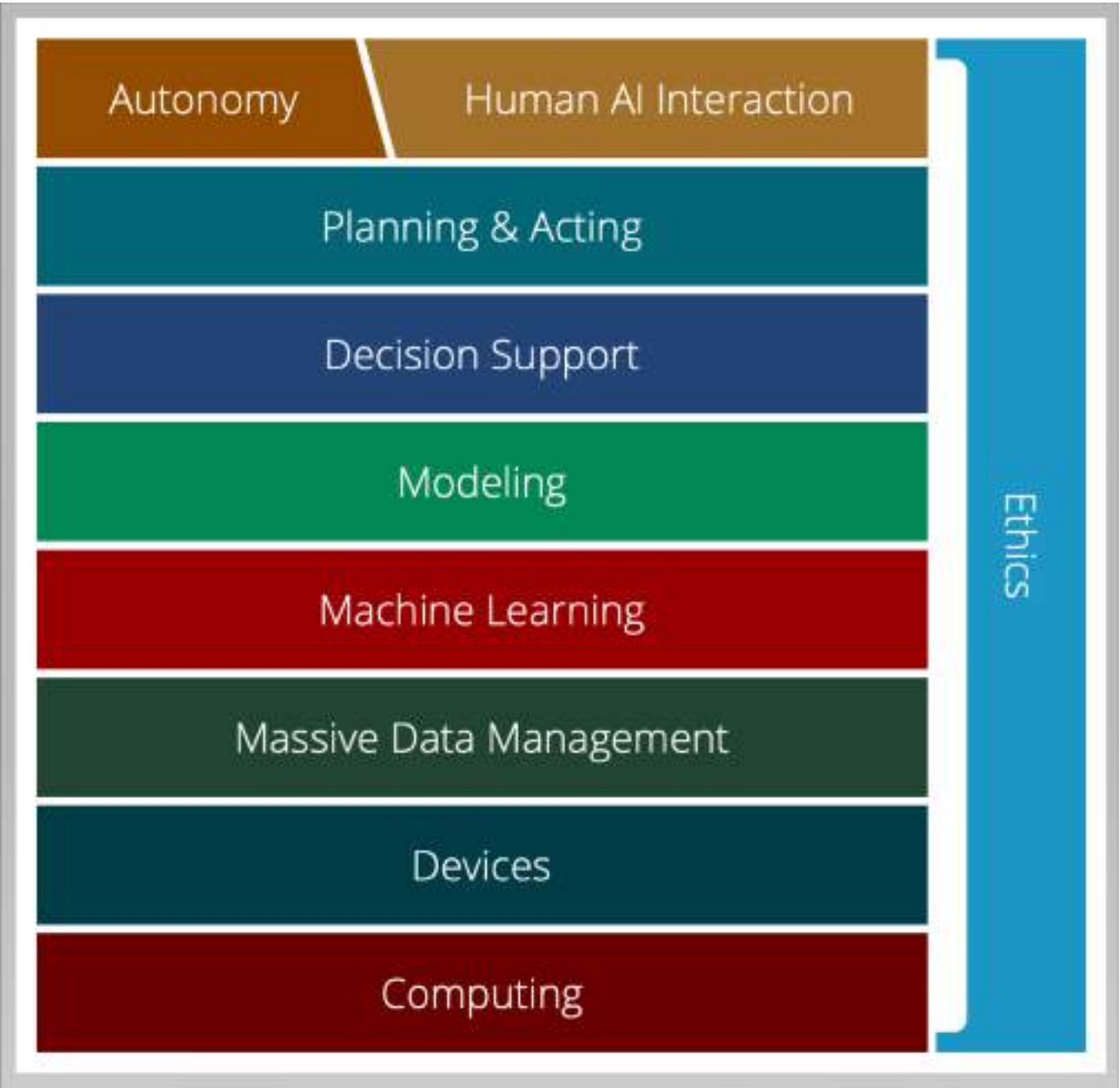
Design for AI

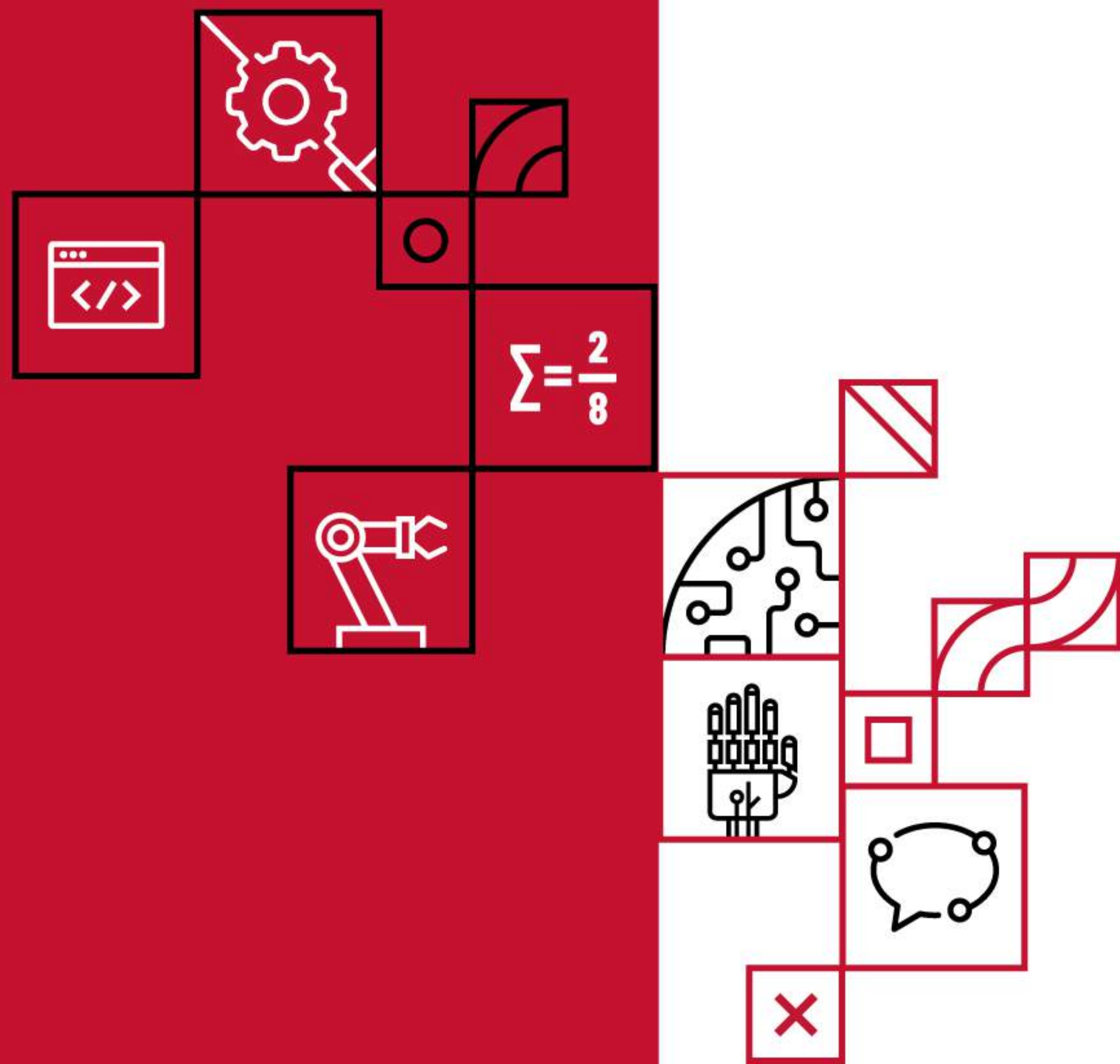
Assisting Humans

Robotics

AI Stack

Autonomy





**Carnegie
Mellon** 
Portugal

www.cmuportugal.org

info@cmuportugal.org