

A - Caracterização do LA	LA	1. Nome/Designação do LA	Laboratório de Robótica e Sistemas de Engenharia
		2. Acrónimo do LA	LARSyS
		3. Referência FCT	LA/P/0083/2020
		4. Coordenador do LA	José Santos-Victor, jav@isr.tecnico.ulisboa.pt, 21 8418294
		5. Data da atribuição do estatuto de LA	2001
	6. Webpage	www.larsys.pt	
	7. Classificação FCT	Excellent	
	8. Financiamento Complementar FCT Total	5,324,305.00	
	Unidade de I&D Principal	1. Nome/Designação da Unidade de I&D	Laboratório de Robótica e Sistemas de Engenharia
		2. Acrónimo	LARSyS
		3. Personalidade jurídica	Pública
		4. Coordenador	José Santos-Victor, jav@isr.tecnico.ulisboa.pt, 21 8418294
		5. Contactos gerais	Morada, e-mail geral, telefone
	6. Webpage	www.larsys.pt	
	7. Classificação FCT	Excelente	
	8. Financiamento Base FCT Total	2,180,000.00	
	9. Financiamento Programático FCT Total	955,000.00	
	Outras Unidades de I&D	1. Nome/Designação da Unidade de I&D	
		2. Acrónimo	
		3. Personalidade jurídica	(e.g. Pública, Privada, Associativa, Cooperativa, Fundação, Outra
4. Coordenador da Unidade		Nome: contactos (e-mail, telefone)	
5. Contactos gerais da Unidade		Morada, e-mail geral, telefone	
6. Webpage			
7. Classificação FCT			
8. Financiamento Base FCT Total			
9. Financiamento Programático FCT Total			
Unidade de Gestão Principal	1. Nome/Designação	IST-ID: Associação do Instituto Superior Técnico para a Investigação e Desenvolvimento	
	2. Personalidade jurídica	Privada sem fins lucrativos	
Unidades de Gestão Participantes	1. Nome/Designação		
	2. Personalidade jurídica	(e.g. Pública, Privada, Associativa, Cooperativa, Fundação, Outra	

B - Constituição da equipa de investigação do LA	N.º de investigadores integrados com PHD	124
	N.º de ETIs integrados	74
	N.º de técnicos	4
	N.º de doutorandos	70
	N.º de outros colaboradores com PHD	
	N.º de outros colaboradores sem PHD	6

C - Missão do LA	1. Missão Statement/Objetivos principais	<p>The Associate Laboratory of Robotics and Engineering Systems (LARSyS) was founded in 2001 to conduct basic and applied research in engineering technologies relevant to industrial applications and societal challenges. LARSyS brings together 124 integrated researchers from 4 research units of IST: the Institute for Systems and Robotics (ISR-Lisboa), the Center for Innovation, Technology and Policy Research (IN+), the Marine Environment and Technology Center (MARETEC), and the Interactive Technologies Institute (ITI). LARSyS is uniquely positioned to contribute to the new research challenges because of:</p> <ul style="list-style-type: none"> - The strong scientific background in Systems, Data Science and Learning; - The interdisciplinary social-technical systems (STS) approach combining analytical tools and methods of engineering, with social sciences and design tools and methods of inquiry; - The real-world, application-driven motivation towards societal problems defined in thematic lines; - The engagement with the social and economic implications of problems and solutions, leading to sustainable development goals through collaborations with industry, public policy recommendations and spin-off companies. <p>LARSyS is committed to pursuing interdisciplinary research and innovation, structured in five thematic lines to address societal challenges and support public policies: OCEANS exploration and exploitation, URBAN sustainability, AIR aeronautics and space systems, LIFE engineering for and from life sciences, and INTERACTION with cognitive robots and enhancing the human experience. These thematic lines support Portugal's public policies, in particular on CLIMATE CHANGE, DEMOGRAPHY AND INEQUALITY and DIGITAL SOCIETY.</p> <p>LARSyS vision is to excel as a research center in the design of complex, socio-technical engineering systems that emerge from massive flows of data and a new generation of autonomous devices and cognitive artifacts, that bridge the gap between the digital and physical.</p>

D - Áreas Científicas	1. Área Científica 1	Engenharia Eletrotécnica, Eletrónica e Informática
	2. Área Científica 2	Ciências da Computação e Ciências da Informação
	3. Área Científica 3	Engenharia Mecânica
	4. Área Científica 4	Engenharia Médica
	5. Área Científica 5	Outras Humanidades

E - Palavras-chave	1. Palavra-chave 1	Robotics and Cyber-physical systems
	2. Palavra-chave 2	Engineering Systems
	3. Palavra-chave 3	Human Computer Interaction
	4. Palavra-chave 4	Environmental technologies
	5. Palavra-chave 5	

F - Linhas Temáticas	1. Linha Temática 1	1. Designação da LT	OCEAN: Exploration and exploitation
		2. Coordenador da LT	António Manuel dos Santos Pascoal
		3. Contactos do Coordenador	antoniom@isr.tecnico.ulisboa.pt
		4. Descrição da LT	The oceans constitute one of the main resources of food, employment, and economic revenue, and are a tremendous potential source of resources and sustainable energies. However, the oceans remain largely unknown and unexploited. The sustainable exploration and exploitation of ocean resources requires the development of new methods and tools and the establishment of strong cooperative links between universities, research institutes, commercial companies, and stakeholders. It is against this backdrop of ideas that the OCEANs thematic line aims to merge scientific knowledge and technological developments with a view to answer the manifold challenges of Ocean Exploration and Exploitation and to take hold of the new research and business opportunities that these activities bring along.
	2. Linha Temática 2	1. Designação da LT	URBAN: Sustainability
		2. Coordenador da LT	Carlos Augusto Santos Silva
		3. Contactos do Coordenador	carlos.santos-silva@tecnico.ulisboa.pt
		4. Descrição da LT	Cities face unprecedented challenges in terms of economic, social and environmental resilience, governance and management. At the same time, they are hubs of innovation and wealth creation, currently housing 72% of the European population. The URBAN thematic line undertakes multi-disciplinary research to promote the sustainable management of urban systems at multiple scales (from buildings through the neighborhood, city to the hinterland) across multiple domains (energy, transport, water, resources, waste) using threefold approach combining: <ul style="list-style-type: none"> 1. the URBAN METABOLISM scientific framework to model and forecast the interactions between multiple urban systems; 2. URBAN INFORMATICS to develop platforms to collect and store data and generate information to feed models and support the development of decision making tools for citizens, municipalities and governmental agencies; and the 3. URBAN SYSTEMS to design new technologies, services and products and policies for urban environment. The coastal urban areas of Lisbon (the only Atlantic capital of Europe) and Funchal (capital of Madeira Island an outermost region of Europe) provide the main case studies and testbeds for this thematic line.
	3. Linha Temática 3	1. Designação da LT	AIR: Space and Aeronautics
		2. Coordenador da LT	Rodrigo Ventura (em substituição de Joana Mendonça)
		3. Contactos do Coordenador	rodrigo.ventura@isr.tecnico.ulisboa.pt
		4. Descrição da LT	Space is both a strategic asset and enormous opportunity for our society and economy. Space technologies, infrastructure, services and data provide the tools needed to address many societal challenges and big global concerns, such as climate change and mobility. It is also a strategic economic cluster for Portugal (with the Embraer center in Évora) envisioned further by the AIR Center initiative. Research will chase the emerging challenges open to related industries in the area of engineering space systems, which can contribute to increase the amount of exports of engineering products and services in Portugal. In this context, the AIR thematic line aims at expanding the work on industrial dynamics, which generated a number of national and international collaborations with relevant players. Adding and gaining from the synergies between diverse R&D units and Industries (e.g., ESA, Embraer, PÉMAS, CEIA, Televet, NASA, MIT-SSL, etc.) research will now progress to address specific technologies, based on an interdisciplinary organization of the several groups at LARSyS to cover i) technological change ii) propulsion iii) human-robot interaction iv) guidance navigation and control and v) satellites and satellite-borne instruments.
	4. Linha Temática 4	1. Designação da LT	LIFE: Engineering for and from the Life Sciences
		2. Coordenador da LT	João Miguel Raposo Sanches
		3. Contactos do Coordenador	jms@tecnico.ulisboa.pt
		4. Descrição da LT	This thematic line aims at coordinating the scientific and technological research activities of LARSyS in topics related to Life Sciences. The overarching goal of the LIFE thematic line is to apply our core knowledge in exact sciences and engineering in basic research in biology, psychology, sports sciences and neurosciences or in the development of new medical and zootechnical tools for diagnosis and therapeutics. The topics covered by LIFE range from the classical diagnosis based on medical imaging and fundamental or applied research in neurosciences to robotic human-machine interaction systems applied in rehabilitation, social robots in active and healthy life supporting systems or new biomi-crofluids lab-on-chip solutions.
	5. Linha Temática 5	1. Designação da LT	INTERACTION: Cognitive robots for human assistance
		2. Coordenador da LT	Alexandre Bernardino
		3. Contactos do Coordenador	alex@isr.tecnico.ulisboa.pt
		4. Descrição da LT	The thematic line INTERACTION addresses the design of Cognitive Robots and Systems (CRS) capable of interacting routinely with humans in different application contexts, e.g. manufacturing, homes, services and public spaces. CRS have huge economic potential as assistants of individuals at home (for physical and mental augmentation, education, entertainment, rehabilitation, active ageing), at work (advanced manufacturing, training), and as networked systems collaborate with humans in critical applications (surveillance and security of people and goods, search-and-rescue, space exploration, agriculture and mining, remote handling of dangerous products). INTERACTION aims at developing novel multidisciplinary approaches to address these challenges bringing together the expertise of the LARSyS groups in control, signal processing, artificial intelligence, machine learning, human-robot interaction, and domain knowledge of relevant applications.