(BL192/2025 IST-ID)

Research Studentships for PhD students

Applications are open for 1 Research Studentship, within the framework of projects 1801P.01516 – OptSurgAI 2024.07248.IACDC, apoiado pela medida "RE-C05-i08.M04 – "Apoiar o lançamento de um programa de projetos de I&D orientado para o desenvolvimento e implementação de sistemas avançados de cibersegurança, inteligência artificial e ciência de dados na administração pública, bem como de um programa de capacitação científica", do Plano de Recuperação e Resiliência – PRR, enquadrado no contrato de financiamento celebrado entre a Estrutura de Missão Recuperar Portugal (EMRP) e a Fundação para a Ciência e a Tecnologia I.P. (FCT) 1801.P01545 - 2024.06929.RESTART, financed by national funds through FCT/MCTES (PIDDAC) and European funds, under the following conditions:

Scientific Area: Artificial Intelligence and Signal Processing

Admission Requirements: *To be enrolled at a PhD at the time of the contract.*

Workplan: Healthcare is moving away from an "one-treatment-fits-all" approach to a patient-centric paradigm. This requires a multi-modal view of the diseases at different levels of granularity: molecular data (e.g, genomics and proteomics) is used as predictive biomarkers; histopathology (WSI) allows the inspection of the tissues at the cellular level, making it possible to analyze their spatial heterogeneity; while imaging techniques convey information about the 2D/3D structure and the overall organ morphology.

As the interest in personalized care grows, the amount of multi-modal data that is being generated creates the ideal environment to capitalize data-centric machine learning approaches. Machine learning will be pivotal in this context, as it can screen massive amounts of data and uncover new patterns faster than humans. However, these developments are hampered by several constraints, such as incomplete/missing modalities, significant differences between modality types, and the longitudinal nature of medical data.

This PhD position seeks a motivated candidate to work on the following topics:

i) Multimodal data integration: imaging data (radiology, skin imaging, pathology), genomics, and tabular/clinical information. The candidate will develop a patient-centric multimodal foundational model that is able to integrate different combinations of data modalities and well as capture time evolution.

ii) Development of generative methods based on causal reasoning to generate missing modalities from the existing ones. This is expected to contribute to the identification of novel biomarkers across the various modalities.

The candidate will work with various healthcare problems, mainly focused on cancer and cardiovascular diseases. The work will be carried out at the Computer and Robot Vision Laboratory (https://vislab.isr.tecnico.ulisboa.pt/) and the PhD will be awarded by Instituto Superior Técnico, University of Lisbon (https://tecnico.ulisboa.pt/en/).

Legislation and Regulations: Statute of Scientific Research Fellow, approved by Law nr. 40/2004, of August 18, as worded by Decree-Law nr. 123/2019, of August 28; FCT Regulation for Research Studentships and Fellowships, available on https://www.fct.pt/apoios/bolsas/docs/RegulamentoBolsasFCT2019.pdf and https://dre.pt/application/file/a/127230968 .

Workplace: The work will be developed at VisLab – Institute for Systems and Robotics, LARSyS, and Instituto Superior Técnico, University of Lisbon, under the scientific supervision of Prof. Catarina Barata.

Duration: The initial research fellowship will have a duration of 12 months. It's expected to begin in October/November 2025 and may be renewed yearly, based on the assessment of the students' performance, up

to the maximum of 48 months, including the duration of the initial contract. The selected candidate will also be supported in the application to a PhD grant from the Portuguese National Science Foundation.

Monthly maintenance allowance: According to the values for Research Fellowships awarded by FCT in Portugal (https://www.fct.pt/fct-atualizou-o-valor-das-bolsas-para-2025/), the amount of the monthly maintenance allowance is € 1309,64 being the payment method by Wire Transfer.

Selection methods: The selection methods will be the following: *Curriculum evaluation, motivation letter, and individual interview*, with the respective weight of 70%/20%/10%. Candidates must have a Master degree on Computer Science, Electrical and Computer Engineering, Biomedical Engineering or similar.

Composition of the selection Jury: Prof. Catarina Barata, Dr. Plinio Moreno, and Dr. Carlos Santiago

Announcement/ notification of the results: The final evaluation results will be communicated to all applicants by email.

Deadlines and procedures of complaint and appeal. A complaint may be lodged from the final decision within 15 working days, or an appeal to the Executive Board of IST-ID within 30 working days, both counted from the respective notification.

Application deadline and formalization: The call is open August 21 until September 20, 2025.

It is mandatory to formalize applications with the submission of the following documents:

B1 Form – Fellowship application (https://ist-id.pt/concursos/bolsas/);

i) *Curriculum Vitae*;

ii) academic degree certificate;

iii) proof of enrollment at a PhD degree – to be presented at the time of celebrating the contract.

iv) motivation letter.

Applications must be submitted at https://isr.tecnico.ulisboa.pt/scholarships/