

Research Studentships (for students of a course that does not award an academic degree)

Applications are open for 1 Research Studentship(s), within the framework of project/R&D institution I-Card / LARSyS, (1801P.01290.1), 2022.02665.PTDC, financed by national funds through FCT/MCTES (PIDDAC), under the following conditions:

Scientific Area: Biomedical Systems and Biosignals

Admission Requirements:

a) to hold a bachelor or master degree and be enrolled at a course that does not award an academic degree and it is integrated in the educational project of a higher education institution, performed in association or cooperation with one or several R&D units;

b) not to exceed with this contract, including the possible renovations, an accumulated period of two years in this type of studentship, continuously or with interruptions.

c) Given the nature of the project, which is aimed at developing imaging biomarkers of invasive cancer cells, the candidate must have advanced knowledge of programming and prior knowledge in analysis and processing of signals and images. Preferred factors: previous experience in manipulating and processing fluorescence images of microscopy of cell structures and organelles, namely cytoskeleton fibers and nuclei, programming skills, especially in Python and Java, experience in image processing and good writing skills in English.

Workplan: This work plan aims at mainly support the FCT project I-Card where we propose to use Artificial Intelligence (AI) to identify and map hidden patterns of invasive cancer cells, based upon quantitative morphometric features and functionally relevant biomarkers. By accurately uncovering a unique architectural signature of cells, we will be able to predict cancer dissemination into neighboring and

This working plan aims at continuing que work that was performed in the last year that is pursuing the following objectives

- 1) Develop and implement cytoskeleton and nucleus segmentation methods to isolate and analyze these cellular structures that we hypothesize that are involved in the process of cell invasion (not started yet).
- 2) Define, characterize, and quantify the organization of the cytoskeleton segmented in the previous step (already started).
- 3) Correlate the morphometric features of the cytoskeleton organization and nucleus with the pathogenicity of the mutations and use an automatic machine learning approach to detect patterns of pathogenicity that could be used in stratification of patients for personalized medicine (already started).
- 4) Validate and test the detection algorithms in vivo using patient-derived xenogra1s to predict their invasive (continuation).

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 the Institute for Systems and Robotics of Instituto Superior Técnico, under the scientific supervision of Professor João Sanches.

Duration: The research fellowship(s) will have the duration of 12 months. It's expected to begin in May 2024. Not Renewed.

Monthly maintenance allowance: According to the values for Research Fellowships awarded by FCT in Portugal (https://www.fct.pt/wp-content/uploads/2024/02/Tabela-de-Valores-SMM_atualizacao-2024.pdf), the amount of the monthly maintenance allowance is € 1.259,64, being the payment method an option of the Fellow by Wire Transfer/Check.

Selection methods: The selection methods will be the following: Curriculum evaluation, individual interview (specifying its conditions), knowledge tests, others), with the respective weight of 100%.

Composition of the selection Jury: João Sanches, Full Professor, Rodrigo Ventura, Associated Professor and Rita Nunes, Assistant Professor, all from the Instituto Superior Técnico.

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 from March 13 until March 26, 2024.

It is mandatory to formalize applications with the submission of the following documents: i) B1 Form – Fellowship application (<https://ist-id.pt/concursos/bolsas/>); ii) *Curriculum Vitae*; iii) academic degree certificate, where applicable; iv) proof of enrollment at a course that does not award an academic degree; v) motivation letter; vi) declaration on honour that the applicant does not exceed with this contract an accumulated period of two years in this type of studentship, continuously or with interruptions.

Applications must be submitted to the email: jmrs@tecnico.ulisboa.pt