CALL FOR GRANT APPLICATIONS
(AE2022-0364)

INESC TEC is now accepting grant applications to award 1 Research Grant (BI) within the scope of the HfPT-3 funded by IAPMEI, Co-financed by Component 5 - Capitalization and Business Innovation, integrated in the Resilience Dimension of the Recovery and Resilience Plan within the scope of the Recovery and Resilience Mechanism (MRR) of the European Union (EU), framed in the Next Generation EU, for the period 2021 - 2026.

1. GRANT DESCRIPTION

Type of grant: Research Grant (BI)

General scientific area: ENGINEERING

Scientific subarea: Electrical engineering

Grant duration: 6 months, starting on 2023-01-16, with the possibility of being renewed until the end of the project.

Scientific advisor: Hélder Filipe Oliveira

Workplace: INESC TEC, Porto, Portugal

Maintenance stipend: € 1144,64, according to the table of monthly maintenance stipend for FCT grants (http://www.fct.pt/apoios/bolsas/valores), paid via bank transfer. Grant holders may be awarded potential supplements, according to a quarterly evaluation process (Articles 19, 21 and 22 of the Regulations for Grants of INESC TEC and Annex II), up to a maximum limit of 50% of the monthly maintenance stipend.

INESC TEC supports costs with registration, enrolment or tuition fees, during the grant duration, under the terms established in the internal document: "Payment of Tuition fees to grant holders".

The grant holder will benefit from health insurance, supported by INESC TEC.

2. OBJECTIVES:

Breast conservative therapies have been allowing many women with breast cancer to avoid a mastectomy. Nevertheless, there are many scenarios where the latter is still conducted. Fortunately, breast reconstruction allows to alleviate the loss of the breast(s) either by making use of an implant or tissue from the body of the patient. Among the autologous options, the DIEP flap is nowadays considered the state-of-the-art. This technique gets its name after the designation of the blood vessel tree that exists in the lower and anterior portion of the abdomen, the Deep Inferior Epigastric Perforator vessels. This is due to the crucial role that these blood vessels play in this procedure, since they are extracted among the tissue and must ensure proper vascularization of the new breast.
When a patient shows interest in this type of reconstruction, the surgical team requests a Computer Tomographic Angiography (CTA) or Magnetic Resonance Angiography (MRA). The radiology team acquires the scans and detects the DIEP vessels. In the end, a report with a description of every perforator that was found (variable but usually around 6-8) is delivered to the surgeons, such that they may determine whether the patient is eligible for the procedure, and in case she is, they may plan which vessels will include in the flap and how it will be collected.
This process is very challenging for the radiological team, mainly because these blood vessels are very small (cross section of 1-2 pixels most of the time).
The objective of this work is to investigate computer vision/machine learning techniques which can achieve a larger automation of the process of segmentation without significantly lowering its accuracy.

3. BRIEF PRESENTATION OF THE WORK PROGRAMME AND TRAINING:

- extend the knowledge of the state of the art in machine learning for vessel segmentation
- identify and select the appropriate methods for the study in question;
- develop the research capacity through the application of the selected methods;
- exercise a critical spirit in the evaluation of the research process and the results obtained.

4. REQUIRED PROFILE:

Admission requirements:

The awarding of the grant is dependent on the applicants' enrolment in study cycle or non-award courses of Higher Education Institutions.
The awarding of the fellowship is dependent on the applicants' enrolment in study cycle or non-award courses of Higher Education Institutions.

Preference factors:

Experience in research projects, and writing of scientific papers

Minimum requirements:

Experience in Computer Vision and machine learning.

5. EVALUATION OF APPLICATIONS AND SELECTION PROCESS:

Selection criteria and corresponding valuation: the first phase comprises the Academic Evaluation (AC), based on the criteria referred to in Article 12 of the Regulations for Grants of INESC TEC, while the second phase comprehends the Individual Interview (EI). All factors are evaluated on a scale of 0 to 100, taking into account the applicants' merit, suitability and conformity with the preference factors.
The weight of the AC factors are as follows: Academic Qualifications (FA, 40%), Scientific Publications (PC, 10%), Experience (EX, 20%) and Motivation Letter (CM, 30%).
Candidates who score less than 50 points in the AC average will be considered excluded on absolute merit. The top five candidates approved on absolute merit will be qualified for the individual interview. The Final Grade (CF) is obtained by the weighted average of AC (80%) and EI (20%).

The Selection Jury is composed of the following members:

President of the Jury: Hélder Filipe Oliveira
Full member: Tânia Pereira
Full member: Ana Filipa Sequeira
Substitute member: Jaime Cardoso

Release of results and prior hearing: the results of the selection process, as well as the terms and procedures for prior hearing, will be released to the applicants by email, under the terms referred to in Article 13 of the Regulations for Studentships and Fellowships of INESC TEC.

6. FORMALISATION OF APPLICATIONS:

Application Documents:

1. Motivation letter;
2. Curriculum Vitae (must include the list of previous fellowships, their type, beginning and end dates, funding entities and host institutions);
3. Certificate or diploma degree dully recognised in Portugal;
   - Documents proving the awarding of academic degrees and diplomas, or the according recognition - in cases of academic degrees or diplomas granted by a foreign higher education institution - can be dismissed in the application process, and replaced by the applicant's declaration of honour, with the verification of said condition taking place during the grant's hiring stage. The submission of the certificate is mandatory when signing the contract.
   - Academic degrees or diplomas awarded by a foreign higher education institution require an authentication by a Portuguese higher education institution, and the corresponding registration on the DGES platform, in conformity with Decree-Law no. 66/2018, of August 16, and Ordinance no. 33/2019, of January 25. More information available on the website https://www.dges.gov.pt/pt/pagina/reconhecimento?plid=374
4. Proof of enrollment in a degree awarding study cycle or in a non degree awarding Higher Education program.
   - The proof of enrollment may be presented just during the grant hiring stage.

5. Signed declaration stating the infringement of the grant holder's duties (article 14, no. 4)
6. Documental evidence to support the country of residence, residence permit or other legally equivalent document, in cases where the applicant is a foreigner or non-resident in Portugal - valid until the beginning of the grant.
7. Other supporting documents relevant to the final assessment.

Failure to deliver the required documents within the 90-day period after the date of the notice of the conditional awarding of the grant implies its cancellation.

Application period: From 2022-11-17 to 2022-12-02

Submission of applications: the application will be formalised by submitting the form available in the *Work With Us* section of INESC TEC website.

7. BINDING LEGISLATION AND REGULATION

The hiring process shall comply with the current legislation regarding the Research Grant Holder Statute, approved by Law no. 40/2004 of August 18, in its current wording, as well as by the Regulations for Grants of INESC TEC and for FCT Grants Regulation in force.

For more information, please check the Regulations for Grants of INESC TEC and relevant annexes at www.inesctec.pt/bolsas