

CALL FOR GRANT APPLICATIONS (AE2023-0364)

INESC TEC is now accepting grant applications to award 1 Research Grant (BI) within the scope of the Produtech_R3 funded by IAPMEI with reference 60 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: 12 months, starting on 2023-10-23, with the possibility of being renewed until the end of the project.

Scientific advisor: Manuel Santos Silva

Workplace: INESC TEC, Porto, Portugal

Maintenance stipend: € 1199,64, [according to the table of monthly maintenance stipend for FCT grants](#), 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:

Research and development of algorithms for allocating tasks to fleets of heterogeneous mobile robots in production lines subject to failures in their operation.

3. BRIEF PRESENTATION OF THE WORK PROGRAMME AND TRAINING:

Nowadays, there is a growing interest in the use of mobile robots to carry out different tasks in manufacturing environments. Given the diverse tasks to be performed in an industrial environment, these fleets are characterized by heterogeneous robots, in terms of their characteristics and capabilities. On the other hand, the use of these vehicles in poorly structured environments is subject to failures of various natures.

Therefore, the idea of this work is to investigate and develop possible algorithms in simulation to carry out the scheduling and planning of the trajectories of fleets of heterogeneous mobile robots (with different characteristics and capabilities, fully automatic and tele-operated/remote-assisted systems, communication failures) in which information about the production lines is entered (planning the location of the lines, in online mode knowing about possible delays and/or small changes) and procedural failures of the robots (the vehicles are unable to solve problems they encounter on their own), etc.

The objective will be to find a set of algorithms that allow planning the location of production lines and allocating tasks to vehicles and replanning them online, depending on the different failure situations that may be encountered.

4. REQUIRED PROFILE:

Admission requirements:

Master's degree in Electrical and Computer Engineering, Computer Engineering, or related areas. The granting of the scholarship assumes that the candidate is a student of a study cycle or a non-degree course, taught at a Higher Education Institution.

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

Preference factors:

AGV / mobile robot simulation experience in FlexSim software valued.

Experience working with robotic manipulators is valued.

Participation in extra-curricular activities linked to robotics is valued.

Minimum requirements:

Experiência em programação nas linguagens C e / ou Python.

Experiência anterior de trabalho com o software de simulação FlexSim.

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, 45%), Scientific Publications (PC, 5%), Experience (EX, 45%) and Motivation Letter (CM, 5%).

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: Manuel Santos Silva

Full member: Pedro Gomes Costa

Full member: Héber Miguel Sobreira

Substitute member:

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 fully 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 2023-09-21 to 2023-10-04

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

