

CALL FOR GRANT APPLICATIONS (AE2024-0531)

INESC TEC is now accepting grant applications to award 1 Research Grant (BI) on the scope TALOS with reference 101119744 funded by the European Commission under the Horizon Europe program for the period 2021-2027.

1. GRANT DESCRIPTION

Type of grant: Research Grant (BI)

General scientific area: ENGINEERING

Scientific subarea: Electrical engineering

Area of Work: Electrical Engineering

Grant duration: 12 months, starting on 2025-02-05, with the possibility of being renewed until the end of the project.

Scientific advisor: Tatiana Guedes

Workplace: INESC TEC, Porto, Portugal

Maintenance stipend: € 1259,64, [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:

The TALOS Project will develop and demonstrate excellent robotics solutions for different photovoltaic (PV) energy scenarios and operations - terrestrial, floating and agriPV, promoting innovation in the energy and agriculture sectors. Talos will demonstrate the added value of robotics solutions and their potential to reduce greenhouse gas (GHG) emissions, which reach values of more than 450 tons/year, to reduce waste (saving up to 35% of water), to reduce operating and maintenance costs (up to 5%), and to optimize human-robot and robot-robot collaborations to reduce the exposure of people to risky scenarios. Dangerous, repetitive or unhealthy tasks will be carried out automatically by the solutions developed at TALOS - such as monitoring, inspection, cleaning, vegetation maintenance, where robust robotic solutions will be developed for all the PV scenarios in question and demonstrated to increase PV plant performance by up to 10%, with a reduction in the exposure of the operation and maintenance (O&M) team by up to 90% and with a reduction in the workload invested in monitoring vegetation and plantations in the scenarios under study, allowing 24/7 inspection periods to be possible.

A platform with multiple robots working together with a recommendation system will feature more than 30 robot-robot interactions, more than 30 inspections, as well as human-in-the-loop solutions and training sessions with end users and workers in the field.

The main objectives of the Fellowship are:

- 1) Apply machine learning algorithms to diagnose faults and malfunctions in photovoltaic plants/farms using data from using data from SCADA systems combined with synthetic digital twin (DT) data.
- 2) Develop and implement a recommendation system that will support operation and maintenance (O&M) teams in providing strategic information on the current status of the various pieces of equipment in a photovoltaic plant.

3. BRIEF PRESENTATION OF THE WORK PROGRAMME AND TRAINING:

- 1) Development of artificial intelligence solutions to support plant O&M teams
- 2) Analysis of data from SCADA systems and DTs to diagnose faults and malfunctions, and simulation of future scenarios related to the impact of O&M strategies.
- 3) Digital modeling of components and equipment, such as battery banks and electrolysers, to business models applied to O&M.
- 4) Dissemination of work in international journals and/or conferences.

4. REQUIRED PROFILE:

Admission requirements:

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

Preference factors:

- Past experience (or academic training) with low, medium and high power photovoltaic systems; - Academic training in operational research.
- Programming skills in Python and MATLAB Script.
- Programming skills in OpenModelica and Simulink.
- Knowledge of Machine Learning algorithms.

Minimum requirements:

- Advanced knowledge of electrical power systems, specifically PV systems, batteries and renewable energy sources in general.

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, 50%), Scientific Publications (PC, 20%), Experience (EX, 20%) and Motivation Letter (CM, 10%).

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%).

DISABILITY INCENTIVE

Candidates who present a degree of disability equal to or greater than 90% will benefit from an incentive (20) in the score of the CV Assessment.

Candidates who present a degree of disability equal to or greater than 60% and less than 90% will also benefit from an incentive (10) in the score of the CV Assessment.

Said score may, in these cases, exceed 100 points.

Candidates must demonstrate the degree of disability during the application, namely through the submission of the Multi-Purpose Medical Certificate of Disability, issued in accordance with Decree-Law no. 202/96, of October 23 - currently in effect.

Candidates must declare, in the application form, the type of disability used throughout the selection process, in order to proceed with the required adaptations.

The Selection Jury is composed of the following members:

President of the Jury: Ricardo Jorge Bessa

Full member: Rui Esteves Araujo

Full member: Justino Miguel Rodrigues

Substitute member: Manuel Matos

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;
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 2024-12-12 to 2025-01-12

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



Funded by the
European Union