CALL FOR GRANT APPLICATIONS

(AE2026-0109)

INESC TEC is now accepting grant applications to award 1 Research Grant (BI) within the scope of the EMPEDOFLEX funded by National Funds through FCT - Portuguese Foundation for Science and Technology, I.P., project reference CETP/0007/2024.

1. GRANT DESCRIPTION

Type of grant: Research Grant (BI)

General scientific area: ENGINEERING

Scientific subarea: Electrical engineering

Area of Work: Explainable Artificial Intelligence for Energy Systems

Grant duration: 12 months, starting on 2026-07-01, with the possibility of being renewed for a maximum term of two years, in the cases of students enrolled in a master's degree.

Scientific advisor: Tiago André Soares

Workplace: INESC TEC, Porto, Portugal

Maintenance stipend: € 1090.98, **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:

- Develop advanced skills in XAI applied to forecasting, analysis, and optimisation models in energy systems within the context of PEDs;

- Support the development and analysis of Machine Learning models used for forecasting renewable generation, demand, and energy flexibility;

- Investigate and apply XAI techniques to explain forecasts, performance indicators, and flexibility management decisions;

- Contribute to improving the interpretability, transparency, and trustworthiness of digital decision-support tools developed in the project;

- Consolidate research, programming, and scientific communication skills, with the production of technical and scientific documentation related to the project.

3. BRIEF PRESENTATION OF THE WORK PROGRAMME AND TRAINING:

The increasing deployment of PEDs, characterised by a high penetration of distributed energy resources and the need for active flexibility management, has driven the development of data-driven digital tools for forecasting, analysis, and optimisation of energy systems. In this context, Machine Learning models are widely used, but their complexity raises significant challenges in terms of interpretability and user trust.

XAI therefore plays a key role in explaining the forecasts, indicators, and decisions generated by these models, contributing to improved transparency and acceptance of decision-support tools in complex, multi-agent energy environments such as PEDs.

The main activities planned include:

- Development and adaptation of energy forecasting models (e.g., renewable generation, demand, flexibility) in the context of PEDs;

- Application and comparison of advanced XAI techniques to explain forecasts, performance indicators, and operational decisions;

- Integration of XAI methods into data pipelines and existing Machine Learning models;

- Critical analysis of interpretability, robustness, and limitations of models and explanation approaches;

- Development of advanced visualisations and interpretable interfaces for different types of users;

- Contribution to the validation of models and XAI approaches using real or simulated data;

- Support in defining evaluation metrics for explanation quality (e.g., fidelity, stability, usefulness);

- Preparation of technical reports and active contribution to scientific publications.

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:
- Experience in Artificial Intelligence, with a focus on XAI and Machine Learning;

- Knowledge and experience in applying XAI techniques (e.g., SHAP, LIME, feature importance methods, or counterfactual explanations);

- Experience in developing forecasting models applied to energy systems (e.g., renewable generation, demand, flexibility);

- Programming skills in Python and experience with data analysis and AI libraries (e.g., Pandas, Scikit-learn, PyTorch, TensorFlow);

- Experience in integrating Machine Learning models into data pipelines or practical applications;

- Knowledge of energy systems, particularly distributed energy resources and flexibility management;

- Experience in data visualisation and development of interpretable interfaces;

- Strong analytical skills and interest in model evaluation and interpretability metrics;

Minimum requirements:
- Basic knowledge of Artificial Intelligence and Machine Learning;

- Fundamental understanding of Explainable AI (XAI);
- Programming skills in Python, including the use of scientific libraries (e.g., NumPy, Pandas);
- Basic knowledge of data analysis and time-series analysis;
- Fluency in English (written and spoken);

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, 10%), Experience (EX, 30%) 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 (90%) and EI (10%).

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: Tiago André Soares
Full member: Tiago Manuel Campelos
Full member: José Villar
Substitute member: Ricardo Jorge Bessa

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 2026-05-07 to 2026-05-21

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