CALL FOR GRANT APPLICATIONS
(AE2025-0351)

INESC TEC is now accepting grant applications to award 1 Research Grant (BI) within the scope of the Multiannual Funding of R&D Units 2025-2029, with the reference UID/50014/2023, Funded by national funds through the Portuguese Foundation for Science and Technology (FCT), I.P.

1. GRANT DESCRIPTION

Type of grant: Research Grant (BI)

General scientific area: COMPUTER SCIENCE

Scientific subarea: Computer Systems

Area of Work: Computer Science

Grant duration: 4 months, starting on 2025-09-10, with the possibility of being renewed until the end of the project.

Scientific advisor: Ricardo Gonçalves Macedo

Workplace: INESC TEC, Braga, Portugal

Maintenance stipend: € 1040.98, 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:

Training deep learning models, particularly large language models (LLMs), currently faces significant challenges related to the efficient use of computational resources. Underutilization of GPUs during the training process results in performance loss and excessive energy consumption, compromising the sustainability and scalability of these systems. This problem becomes even more critical in distributed environments, where hundreds or even thousands of GPUs are used concurrently.
The main objective of this grant is to develop a system capable of improving the energy efficiency of GPUs in large language model training scenarios. The system should be agnostic to the model being trained, as well as minimize the impact on total training time and reduce the energy consumption of the GPUs involved.

3. BRIEF PRESENTATION OF THE WORK PROGRAMME AND TRAINING:

Responsibilities under the grant:
- Design a system for managing the energy consumption of GPUs for LLMs;
- Implement and optimize a prototype based on the initial design;
- Conduct experimental evaluations of the developed prototype, using a variety of models and hardware devices (e.g., various processing and storage devices).

The tasks described in this work plan require the application and development of concepts and techniques from Computer Engineering, which are typically addressed in the core curriculum of the Integrated Master's Degree in Computer Engineering or the Master's Degree in Computer Engineering.

4. REQUIRED PROFILE:

Admission requirements:

BSc Degree in Informatics Engineering Sciences.
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 the design and development on energy control systems for GPUs;
- Solid knowledge in the state-of-the-art of energy control systems for deep learning;
- Experience with the C++ programming language.

Minimum requirements:

Solid knowledge of energy monitoring and energy control systems (i.e., Intel RAPL, PowerJoular, EnergAt, NVML, DVFS).
Knowledge on deep learning frameworks and models (i.e., PyTorch, ResNet18, AlexNet, Cifar-10), as well as heterogenous workloads (e.g., cloud-based workloads, supercomputing workloads)
Solid knowledge of operating systems.
Solid knowledge of distributed systems.

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, 70%), Scientific Publications (PC, 10%), Experience (EX, 10%) 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 Gonçalves Macedo
Full member: Cláudia Vanessa Brito
Full member: Tânia Esteves
Substitute member: João Tiago Paulo

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 2025-08-07 to 2025-08-22

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