CALL FOR GRANT APPLICATIONS
(AE2025-0258)

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: Informatics

Area of Work: Operating Systems

Grant duration: 6 months, starting on 2025-07-29with the possibility of being renewed for a maximum term of one year, in cases where the grant has been awarded to students who are enrolled in non-award courses, or up to two years, in the cases of students enrolled in a master's degree.

Scientific advisor: Tânia Esteves

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:

The main objective of the work to be developed during the fellowship is the design of a solution based on eBPF to instrument points of interest in the Linux kernel, with the goal of collecting and analyzing detailed information about the state of processes and files running on the system. Additionally, the collected data is expected to be presented through specialized visualizations, facilitating the analysis and interpretation of the system's state. This solution will be essential for understanding application behavior, identifying execution and file access patterns, and validating the correctness and security of their implementation.

3. BRIEF PRESENTATION OF THE WORK PROGRAMME AND TRAINING:

The work plan for this scholarship includes the following main activities:
- Development of a tracing tool using eBPF (with libbpf) to instrument various points of interest in the Linux kernel (e.g., system calls, VFS, among others) and collect detailed information about the state of processes and files running on the system. Through this instrumentation, it should be possible to monitor and analyze application behavior, with special attention to critical operations such as program execution, process creation and termination, and interactions with the file system.
- Implementation of a specialized visualization platform capable of processing the collected data and providing clear and intuitive visualizations representing the system state and monitored activities.
- Experimental evaluation of the developed solution through tests with multiple programs and different kernel interaction scenarios, aiming to validate its effectiveness and applicability.

The tasks described in this work plan demand the application and development of concepts and techniques in the areas of Computer Science and Informatics Engineering, which are usually introduced in curricular units included in the curricula of MSc courses in Computer Science and Informatics Engineering.

4. REQUIRED PROFILE:

Admission requirements:
BSc Degree in Computer Science or 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 with I/O request tracing tools (e.g., Strace).
- Knowledge of visualization tools (e.g., Vue.js).

Minimum requirements:
- Solid knowledge of operating systems.
- Experience with the POSIX API and system calls.
- Hands-on experience with eBPF technology and the libbpf library.

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: Tânia Esteves
Full member: João Tiago Paulo
Full member: Cláudia Vanessa Brito
Substitute member: Ricardo Gonçalves Macedo

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 2025-06-27 to 2025-07-10

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