CALL FOR GRANT APPLICATIONS
(AE2025-0305)

INESC TEC is now accepting grant applications to award 1 Research Grant (BI) within the scope of the within the HOSKY project with reference 2024.07347.IACDC, co-funded 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, measure RE-C05-i08.M04 - To support the launch of a programme of R&D projects geared towards the development and implementation of advanced cybersecurity, artificial intelligence and data science systems in public administration, as well as a scientific training programme, as part of the funding contract signed between the Recovering Portugal Mission Structure (EMRP) and the FCT - Fundacao para a Ciencia e a Tecnologia, I.P. (Portuguese Foundation for Science and Technology), as intermediary beneficiary.

1. GRANT DESCRIPTION

Type of grant: Research Grant (BI)

General scientific area: COMPUTER SCIENCE

Scientific subarea: Programming,Informatics,Computer Systems

Area of Work: Cybersecurity

Grant duration: 5 months, starting on 2025-09-01.

Scientific advisor: João Soares Resende

Workplace: INESC TEC, Porto, 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:

1. Analyze the target infrastructure
Conduct a detailed mapping of the test technological infrastructure, identifying key processes, system interactions, available services, and critical components from a cybersecurity perspective. This analysis will serve as a foundation for identifying vulnerable points and potential attack vectors.
2. Develop an automated fuzzer generation framework
Create a framework capable of automatically generating fuzzers for complex software libraries, synthesizing test cases and input sequences without the need for manual engineering. The goal is to systematically explore vulnerabilities, ensuring broad and effective code coverage.
3. Design a feature extraction and behavior visualization system
Design a framework that extracts relevant features from system execution and presents interpretable visualizations for cybersecurity experts. This tool should support behavioral analysis, anomaly detection, and the generation of actionable insights.
4. Integrate and test the tools in a realistic environment
Integrate the developed modules (infrastructure analysis, fuzzer generation, and behavior visualization) into a representative lab environment, with the support of the UPorto CSIRT team. This environment will be used for testing, validation, and assessment of the tools' effectiveness in realistic cybersecurity scenarios.

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3. BRIEF PRESENTATION OF THE WORK PROGRAMME AND TRAINING:

The proposed work plan aims to develop advanced cybersecurity tools through the analysis of technological infrastructures, the automation of software testing, the interpretation of system behavior, and validation in controlled environments with the support of specialized incident response teams (CSIRTs).

The first phase will involve a detailed analysis of a realistic technological infrastructure, with the objective of mapping services, information flows, and critical components. This step will provide a foundation for identifying vulnerable areas and potential attack vectors, serving as the basis for subsequent phases.

An automated framework for fuzzer generation will then be developed, capable of synthesizing test cases and input sequences for complex software libraries without the need for manual engineering. The approach will combine static and dynamic analysis techniques, focusing on the discovery of security vulnerabilities.

In parallel, a framework for feature extraction and system behavior visualization will be designed, enabling the generation of actionable insights for cybersecurity experts. This tool will support anomaly detection and behavioral analysis based on system execution data.

In the final phase, the developed components will be integrated and evaluated in a representative lab environment, in close collaboration with a CSIRT team. This step aims to test the effectiveness of the tools in realistic scenarios and to strengthen the practical applicability of the results.

4. REQUIRED PROFILE:

Admission requirements:
Bachelor's degree in Computer Science or a related field.
The awarding of the fellowship is dependent on the applicants' enrolment in study cycle or non-award courses of Higher Education Institutions.

Preference factors:
Participation in one or more competition of Artificial intelligence and capture the flag.
Currently taking the Computer Security module

Minimum requirements:
At least one write-up of a Capture the Flag (CTF) challenge.

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, 20%) and Motivation Letter (CM, 20%).

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 (70%) and EI (30%).

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: João Soares Resende
Full member: Miguel Gonçalves Areias

Full member: Ricardo Rocha
Substitute member: Fernando Silva

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 2025-07-17 to 2025-07-30

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

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