CALL FOR GRANT APPLICATIONS
(AE2022-0083)

INESC TEC is now accepting grant applications to award 1 Research Grant (BI) within the scope of the IBEX funded by National Funds through FCT - Portuguese Foundation for Science and Technology, I.P., project (reference PTDC/CCI-COM/4280/2021

1. GRANT DESCRIPTION

Type of grant: Research Grant (BI)

General scientific area: COMPUTER SCIENCE

Scientific subarea:

Grant duration: 12 months, starting on 2022-04-05, with the possibility of being renewed until the end of the project.

Scientific advisor: Renato Jorge Neves

Workplace: INESC TEC, Braga, Portugal

Maintenance stipend: € 1144,64, according to the table of monthly maintenance stipend for FCT grants (http://www.fct.pt/apoios/bolsas/valores), 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 project aims at exploring notions of equivalence suitable for programs that interact with physical processes such as motion, velocity, and temperature. More precisely, we intend to develop mathematical foundations to reason rigorously about inaccuracies in such programs - ranging from aspects of syntax and semantics to the introduction of quantitative logics that allow deductive reasoning on (in)equivalence.

3. BRIEF PRESENTATION OF THE WORK PROGRAMME AND TRAINING:

- Detailed review of the literature on quantitative equivalence of programs, with particular emphasis on the hybrid and probabilistic domains. - Introduction of an equational deductive system for a hybrid while-language.
- Extension of this hybrid while-language with probabilistic functionalities, and introduction of a corresponding equational deductive system.
- Extension of the aforementioned hybrid-probabilistic language with communication and concurrency features, and introduction of a corresponding equational deductive system.
- Study of suitable logics for verification of programs written in the languages mentioned in the previous points.
- Systematic study of property preservation in quantitative dynamic logic regarding (in)equivalence in these languages.
- Analysis of case-studies and in particular the application of the theory developed to cyber-physical systems, followed by writing a report on the conclusions obtained.
- Writing of the doctoral dissertation.

4. REQUIRED PROFILE:

Admission requirements:
  PhD student in Computer Science, Mathematics, Informatics or similar
  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 research projects and writing of scientific articles; - Good academic performance

Minimum requirements:
  - Solid mathematical knowledge, with emphasis on Analysis and Linear Algebra as we will extensively work with differential equations and topology;
  - 1 paper published in a peer-reviewed conference or journal.

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, 10%) 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 (80%) and EI (20%).

The Selection Jury is composed of the following members:
  President of the Jury: Renato Jorge Neves
  Full member: Luís Soares Barbosa
  Full member: José Paiva Proença
  Substitute member: José Nuno Oliveira

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 dully recognised in Portugal;
   - Documents proving the awarding of academic degrees and diplomas, or the according recognition - in cases of academic degrees or diplomas granted by a foreign higher education institution - can be dismissed in the application process, and replaced by the applicant's declaration of honour, with the verification of said condition taking place during the grant's hiring stage. The submission of the certificate is mandatory when signing the contract.
   - Academic degrees or diplomas awarded by a foreign higher education institution require an authentication by a Portuguese higher education institution, and the corresponding registration on the DGES platform, in conformity with Decree-Law no. 66/2018, of August 16, and Ordinance no. 33/2019, of January 25. More information available on the website https://www.dges.gov.pt/pt/pagina/reconhecimento?plid=374
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 2022-03-07 to 2022-03-18

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