CALL FOR GRANT APPLICATIONS
(AE2023-0314)

INESC TEC is now accepting grant applications to award 1 Research Grant (BI) on the scope AI4REALNET with reference 101119527 funded by the European Commission under the Horizon Europe program for the period 2021-2027.

1. GRANT DESCRIPTION

Type of grant: Research Grant (BI)

General scientific area: COMPUTER SCIENCE

Scientific subarea: Programming,Computer Systems,Informatics

Grant duration: 12 months, starting on 2023-10-01, with the possibility of being renewed until the end of the project.

Scientific advisor: Pedro Gabriel Ferreira

Workplace: INESC TEC, Porto, Portugal

Maintenance stipend: € 1199,64, 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 AI4REALNET Project will develop the next generation of decision-making methods powered by supervised and reinforcement learning, which aim at trustworthiness in AI-assisted human control with augmented cognition, hybrid human-AI co-learning and autonomous AI, with the resilience, safety, and security of critical infrastructures as core requirements. Moreover, it will boost the development and validation of novel AI algorithms, by the European AI community, through open-source digital environments capable of emulating realistic scenarios of physical systems (power grid, railway and air traffic management) operation and human decision-making, enabling a direct assessment of AI-based decision quality.

The main objectives of the Fellowship are:
- Apply reinforcement learning algorithms to optimize electrical networks considering energy transition challenges.
- Develop and apply a protocol for assessing the robustness and safety of fully human-operated, AI-assisted human-operated and autonomous systems.

3. BRIEF PRESENTATION OF THE WORK PROGRAMME AND TRAINING:

- Development of workflows and methods enabling AI-powered decision assistants to support full human operators control under risk and model uncertainty, and considering human-AI co-learning.
- Develop methodologies for assessing the robustness and safety of fully human-operated, AI-assisted human-operated and autonomous systems, considering risk assessment aligned with the EU AI Act, reliability and robustness quantified by providing guidance on how to create and use adversarial datasets.
- Validate the developed methodologies on real data and open-source simulators for power network use cases.
- Dissemination of the work in international journals and/or conferences

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4. REQUIRED PROFILE:

Admission requirements:

Hold a Master's degree in applied mathematics or computer science or informatics or electrical engineering or similar. Master's degree in other scientific-technological areas may be considered if duly justified.
The awarding of the fellowship is dependent on the applicants' enrolment in study cycle or non-award courses of Higher Education Institutions.

Preference factors:

- Past experience (or academic background) with supervised learning and reinforcement learning.
- Publication of scientific papers and presentations (oral communications and posters) in the areas of artificial intelligence, data mining, machine learning or operations research.
- Demonstrated experience (e.g. github code, prototypes, scientific papers) in developing machine learning pipelines for analyzing large volumes of data.
- Demonstrated experience in developing software applications (e.g. prototypes, software, websites, etc.).
- Training in micro-courses and projects (e.g. platforms such as Coursera, Udemy, etc.) in programming, data analysis, machine learning, project management or good software development practices.

Minimum requirements:

- Technically, the candidate should have a demonstrated proficiency in the following points: Linux environment, command line tools, Python language programming and/or R statistical language.
- Academic background in Artificial Intelligence, Data Science and/or Operations Research.
- Excellent level of English, oral and written.

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, 20%) 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 (70%) and EI (30%).

The Selection Jury is composed of the following members:

President of the Jury: Pedro Gabriel Ferreira
Full member: Ricardo Jorge Bessa
Full member: Rita Paula Ribeiro
Substitute member: Carla Silva Gonçalves

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

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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 2023-07-27 to 2023-08-23

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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