CALL FOR GRANT APPLICATIONS

(AE2026-0131)

INESC TEC is now accepting grant applications to award 1 Post Doctoral Research Grant (BIPD) within the scope of the within the QuantumCLP project with reference 2024.15096.PEX, Funded by National Funds through the FCT - Fundacao para a Ciencia e a Tecnologia, I.P.

1. GRANT DESCRIPTION

Type of grant: Post Doctoral Research Grant (BIPD)

General scientific area: COMPUTER SCIENCE,ENGINEERING,MATHEMATICS

Scientific subarea: Programming,Computer Systems,Industrial engineering,Algorithms,Combinatorial analysis,Applied mathematics

Area of Work: Development of disruptive approaches in the field of operations research for solving Cutting and Packing problems, namely hybrid solutions integrating classical and quantum computing.

Grant duration: 12 months, starting on 2026-07-01, with the possibility of being renewed until the end of the project.

Scientific advisor: Beatriz Brito Oliveira

Workplace: INESC TEC, Porto, Portugal

Maintenance stipend: € 1901.00, **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 is the development of advanced methodologies for solving Cutting and Packing problems, through the integration of Operations Research techniques with emerging quantum computing techniques, namely through formulations compatible with quantum paradigms.

The specific objectives are:

- To develop mathematical models for cutting and packing problems, namely three-imensional container loading problems (3D-CLP), incorporating relevant constraints;

- To explore and develop formulations compatible with quantum computing, namely through QUBO-type models (Quadratic Unconstrained Binary Optimization);

- To develop and evaluate hybrid quantum-classical methodologies;

- To contribute to the advancement of the state of the art in Operations Research and combinatorial optimisation, exploring highly innovative solutions.

3. BRIEF PRESENTATION OF THE WORK PROGRAMME AND TRAINING:

This post-doctoral fellowship will take place within the scope of the project "Quantum computing optimization for container loading problems: a new frontier in logistics optimization" (2024.15096.PEX), funded by the Foundation for Science and Technology (FCT), with the work plan structured in 3 main phases, namely: (1) Characterisation and mathematical modelling of Cutting and Packing Problems based on linear/non-linear programming; (2) Investigation of formulations compatible with quantum computing, namely through QUBO-type representations and the study of different hybridisation strategies, aiming to maximise solution quality and computational efficiency; and (3) carrying out computational tests on benchmark instances, as well as performance analysis in terms of solution quality, computational efficiency and scalability.

The development of the work will be accompanied by a strengthening of scientific competencies in the areas of operational research and combinatorial optimisation, as well as a deepening of knowledge in quantum computing applied to optimisation and hybrid quantum-classical methodologies. Participation in scientific conferences and the publication of results in international peer-reviewed journals are also anticipated, contributing to the consolidation of the fellow's scientific career and to the dissemination of the project's results.

4. REQUIRED PROFILE:

Admission requirements:

PhD in Industrial Engineering, Management, Mathematics, Physics, or related relevant fields, with a focus on the application of Operations Research methodologies, models, and algorithms, and on Quantum Computing.
The PhD degree must have been obtained within the three years prior to the date of submission of the application and the research work leading to the award must have been carried out at a host entity other than INESC TEC.

Preference factors:
- Knowledge of quantum computing applied to optimization, including QUBO (Quadratic Unconstrained Binary Optimization) formulations;

- Relevant scientific publications in the field.

Minimum requirements:
- Completed PhD in the indicated fields;
- Strong knowledge of Operations Research;
- Experience with Cutting and Packing Problems or combinatorial problems of a similar nature;
- Experience with linear programming, integer programming, and nonlinear programming models;
- Advanced programming skills (Python or equivalent);
- Fluent in Portuguese and English.

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, 30%), Scientific Publications (PC, 20%), Experience (EX, 30%) 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: Beatriz Brito Oliveira
Full member: Luís Paulo Santos
Full member: Catarina Moreira Marques
Substitute member: António Galrão Ramos

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. Signed declaration stating the infringement of the grant holder's duties (article 14, no. 4)
5. 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.
6. 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 2026-05-14 to 2026-05-27

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