

CALL FOR GRANT APPLICATIONS

(AE2026-0215)

INESC TEC is now accepting grant applications to award 1 Research Grant (BI) within the scope of the within the scope of the project LOGIX, with reference 26049 (COMPETE2030-FEDER-03240400) Co-funded by ERDF - European Regional Development Fund through the Innovation and Digital Transition Thematic Programme (COMPETE 2030) within the scope of Portugal 2030.

1. GRANT DESCRIPTION

Type of grant: Research Grant (BI)

General scientific area: ENGINEERING

Scientific subarea: Electrical engineering

Area of Work: Robotics and Automation

Grant duration: 12 months, starting on 2026-09-14, with the possibility of being renewed until the end of the project.

Scientific advisor: Marcelo Petry

Workplace: INESC TEC, Porto, Portugal

Maintenance stipend: € 1359.64, [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 scholarship aims to support research and development activities within the Logix project, focusing on the handling of boxes with humanoid robots in logistics environments. The work will concentrate on box detection and location, bimanual gripping strategies, motion planning, coordination between handling and balance, as well as the integration of visual inspection and product identification mechanisms. The solution will be validated in pick-and-place tasks representative of returns sorting processes, evaluating its safety, robustness, efficiency, and integration capacity into real logistics flows. The scholarship will provide the student with direct contact with emerging technologies in humanoid robotics, computer vision, and artificial intelligence, in an applied research context with high potential for industrial impact.

3. BRIEF PRESENTATION OF THE WORK PROGRAMME AND TRAINING:

The scholarship recipient will participate in the different stages of the research cycle, from problem analysis and algorithm development to its implementation and experimental evaluation on a real robotic platform:

1. Study of the state of the art and definition of requirements



A critical analysis of existing approaches for robotic box handling, humanoid robotics, bimanual grasping, computer vision, and automation of return processes will be carried out:

- survey of the main techniques and platforms available;
- characterization of the boxes and logistical scenarios considered;
- identification of safety, reach, load, balance, and workspace constraints;
- definition of handling tasks, test scenarios, and evaluation metrics.

2. Preparation and integration of the humanoid platform

The configuration of the robotic platform and the components necessary for the execution of the proposed tasks will be carried out, including sensors, cameras, communication interfaces, and control modules:

- configuration of the development and simulation environment;
- calibration of the robot's arms, hands, and sensors;
- calibration between the robot and the vision systems;
- Integration of RGB and/or Lidar cameras;
- Development of communication interfaces between perception, planning, and control modules;
- Definition of safety, supervision, and operation shutdown mechanisms.

3. Development of the perception system

Methods will be developed to allow the robot to detect boxes, estimate their position and orientation, and identify suitable points for their manipulation. Classical approaches based on image processing and point clouds, as well as segmentation and classification methods based on artificial intelligence, will be studied. The system should be able to handle variations in:

- Dimension, geometry, and appearance of the boxes;
- Position and orientation;
- Lighting;
- Partial occlusions;
- Arrangement of objects in the workspace.

4. Development of bimanual gripping strategies

Strategies will be investigated to allow the robot to use both arms in a coordinated manner to safely grasp, lift, transport, and place boxes:

- Definition of suitable gripping points;
- Automatic generation of arm and hand configurations;
- Fine visual adjustment of the gripping pose;
- Bimanual coordination during lifting and transport;
- Adaptation of the strategy to the dimensions and mass of the boxes;
- Detection of unstable grips and recovery in case of failures.

5. Planning and control of handling tasks

Algorithms will be developed to autonomously perform pick-and-place operations at defined points in the sorting zone:

- Planning collision-free trajectories;
- Coordination between arms, torso, and robot posture;
- Control of approach, gripping, lifting, and placement of boxes;
- Sequencing of the different actions of the task;
- Real-time monitoring of execution;
- Implementation of recovery mechanisms in case of perception, planning, or handling errors.

6. Integration of visual identification and inspection resources

The possibility of using the robot's vision system to support the sorting process and the digital recording of returns will be studied. Functionalities such as the following may be implemented:

- Reading barcodes and QR codes;
- Recognition of fiducial markers; • Identification of the box or product;
- Verification of the presence and arrangement of items;
- Visual classification or segmentation using artificial intelligence;
- Association of inspection results with the digital process management system.

7. Experimental Validation and Performance Evaluation

The developed modules will initially be tested in a controlled environment and subsequently evaluated in scenarios representative of the LOGIX project's return flows. The evaluation will consider, among others, the following indicators:

- Success rate in detecting and locating boxes;
- Success rate of grasping and placing;

- Number of boxes handled per unit of time;
- Average execution time of each cycle;
- Placement accuracy;
- Occurrence of collisions or unsafe situations;
- Robustness in the face of variations in boxes and the environment;
- Feasibility of visual inspection and reintroduction into the logistics flow.

8. Documentation, Analysis, and Dissemination of Results

Documentation of the developed methodologies and critical analysis of experimental results:

- preparation of technical documentation for the software and experimental procedures;
- creation of test protocols and datasets;
- preparation of system demonstrations;
- participation in the preparation of the performance report for the humanoid robot control module;
- contribution to scientific publications, technical communications, or other actions to disseminate the results.

4. REQUIRED PROFILE:

Admission requirements:

Master's degree in Electrical Engineering or related fields.

The awarding of the fellowship is dependent on the applicants' enrolment in study cycle or non-award courses of Higher Education Institutions.

Preference factors:

The following elements will be valued:

- Knowledge and experience with OpenCV and PCL libraries.
- Experience with RGB-D cameras and point cloud processing.
- Experience with robotic simulators, such as Gazebo or Isaac Sim.
- Participation in robotics competitions.
- Fluency in spoken and written English.

Minimum requirements:

The candidate must meet the following requirements:

- Completed Master's degree in Electrical and Computer Engineering or related fields.
- Be enrolled in a doctoral program in Electrical and Computer Engineering or related fields, or in a non-degree-granting program, under the terms applicable to the scholarship regulations.
- Proven experience in developing R&D projects with industry.
- Fundamental knowledge of robotics, including kinematics, motion planning, control, or robotic manipulation.

- Experience in the development, integration, or validation of robotic solutions and/or automated systems in a laboratory or industrial environment.
- Knowledge of C++ and Python programming.
- Knowledge and experience with the ROS/ROS2 framework.

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, 45%), Scientific Publications (PC, 5%), Experience (EX, 45%) and Motivation Letter (CM, 5%).

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: Marcelo Petry

Full member: Luís Freitas Rocha

Full member: Manuel Santos Silva

Substitute member: João Pedro Souza

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 2026-07-28 to 2026-08-10

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

