

CALL FOR GRANT APPLICATIONS (AE2025-0329)

INESC TEC is now accepting grant applications to award 1 Research Grant (BI) on the scope SEAGUARD with reference 101168489 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: ENGINEERING

Scientific subarea: Computer engineering

Area of Work: Underwater robotics, acoustic signal processing

Grant duration: 6 months, starting on 2025-09-01, with the possibility of being renewed until the end of the project.

Scientific advisor: Bruno Miguel Ferreira

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:

Study the state-of-the-art in passive acoustic detection and underwater tracking techniques, including the physics of underwater sound propagation and typical sensor network configurations.
Develop detection and localization algorithms, with an emphasis on TDOA, DOA, beamforming, and real-time multiple-target tracking methods.
Validate the algorithms in simulated scenarios, evaluating robustness and accuracy under realistic conditions.
Implement and experimentally test the system in a real environment, with hardware integration and validation campaigns at sea.
Produce documentation: internal reports and publications.

3. BRIEF PRESENTATION OF THE WORK PROGRAMME AND TRAINING:

Study existing passive acoustic detection methodologies and tracking algorithms in underwater environments.
Analyze the physics of underwater acoustic propagation, including effects such as refraction, absorption, and background noise.
Identify acoustic sensor network architectures (hydrophones, linear arrays, distributed arrays, etc.) and their data models.
Implement passive and active detection algorithms based on cross-correlation, beamforming, or other methods.
Estimate Time Difference of Arrival (TDOA), Direction of Arrival (DOA), and fusion of data from multiple receivers.
Develop multi-target tracking techniques (e.g., extended Kalman filters, particle filters, or Multiple Hypothesis Tracking).
Simulate moving mobile acoustic sources.

Evaluate the robustness of algorithms to noise, multipath, etc.
Define and evaluate performance metrics: location accuracy, detection rate, computational consumption, etc.
Integrate the algorithms into a real-time system (on-board hardware or ground station).
Conduct test campaigns in a controlled environment (tank) and in the open sea.
Calibrate and validate the system with known (ground truth) and unknown sources.

4. REQUIRED PROFILE:

Admission requirements:

Degree in Electrical Engineering or 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:

Previous experience in underwater robotics or acoustic signal processing.

Minimum requirements:

Programming experience, basic knowledge of dynamic/control systems, undergraduate grade greater than or equal to 15 (scale from 0 to 20).

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, 70%), Scientific Publications (PC, 0%), 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 (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: Bruno Miguel Ferreira
Full member: Nuno Cruz
Full member: Nuno Miguel Abreu
Substitute member:

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 2025-07-24 to 2025-08-06

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



Funded by the
European Union