

## CALL FOR GRANT APPLICATIONS (AE2021-0145)

INESC TEC is now accepting grant applications to award 1 Research Grant (BI) within the scope of the INESC TEC LA funded by National Funds through FCT - Portuguese Foundation for Science and Technology, I.P., project (reference UIDB/50014/2020)

### 1. GRANT DESCRIPTION

**Type of grant:** Research Grant (BI)

**General scientific area:** ENGINEERING

**Scientific subarea:** Electrical engineering

**Grant duration:** 4 months, starting on 2021-09-01, with the possibility of being renewed until the end of the project.

**Scientific advisor:** Nuno Miguel Paulino

**Workplace:** INESC TEC, Porto, Portugal

**Maintenance stipend:** € 1104,64, 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.

Costs attributable to INESC TEC may include registration, enrolment or tuition fee stipend, either directly or through reimbursement, during the grant duration.

The grant holder will benefit from health insurance, supported by INESC TEC.

### 2. OBJECTIVES:

- Contribute to the state-of-the-art in indoor localization systems based on Bluetooth Low Energy (BLE);
- Identification and selection of the most adequate optimization methods to address the proposed workplan;
- Develop the research skills through the application of the selected methods;
- Apply the scientific method on the research process and a critical attitude on the obtained results;
- Co-author a scientific article for dissemination of achieved results.

### 3. BRIEF PRESENTATION OF THE WORK PROGRAMME AND TRAINING:

- Become acquainted with the current state of the implementation of BLE 5.1 based indoor location solution.
- Setup of the software development environment, software repositories, and development environments for design of circuit schematics and printed circuit board (PCB) design (KiCAD EDA).
- Revision and re-implementation of the current antenna array board, according to any detected failures or new requirements, e.g., communication interfaces or component replacement.
- Iteration on current design for embedded software, in order to implement: continuous transmission of phase data, and capabilities for protocol based communication with external devices.
- Implementation of the algorithms for calculation of Angle-of-Arrival (AoA).
- Study and implementation of heuristic methods for treatment of data to improve the quality of AoA estimate.
- Experimental validation of AoA estimation in real time.
- Writing of the grant activities report.

#### 4. REQUIRED PROFILE:

##### Admission requirements:

Master's in Electric Engineering 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:

- Correctness and clarity in production of written communication, specifically technical (reports) and scientific (articles in international conferences or journals) - experience in C/C++ or Java programming - autonomy - availability for laboratory work in-person (i.e., non-remotely) (based on the project needs)

##### Minimum requirements:

- experience in software embedded development in baremetal systems (i.e., without operating system) with external peripheral interfaces (through direct control of GPIOs and using standard protocols, e.g., SPI)  
- experience in circuit schematic design and printed circuit board (PCB) design

#### 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, 40%), Scientific Publications (PC, 10%), Experience (EX, 40%) 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: Luís Manuel Pessoa

Full member: Nuno Miguel Paulino

Full member: Rui Lopes Campos

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 duly 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 2021-07-27 to 2021-08-10

**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](http://www.inesctec.pt/bolsas)

