CALL FOR GRANT APPLICATIONS
(AE2025-0564)

INESC TEC is now accepting grant applications to award 4 Research Initiation Grant (BII) within the scope of the NEXUS funded by IAPMEI with reference 53 Co-financed by Component 5 - Capitalization and Business Innovation, integrated in the Resilience Dimension of the Recovery and Resilience Plan within the scope of the Recovery and Resilience Mechanism (MRR) of the European Union (EU), framed in the Next Generation EU, for the period 2021 - 2026.

1. GRANT DESCRIPTION

Type of grant: Research Initiation Grant (BII)

General scientific area: ENGINEERING

Scientific subarea: Electrical engineering

Area of Work: Telecommunications

Grant duration: 5 months 19 days, starting on 2026-01-12.

Scientific advisor: Hélder Martins Fontes

Workplace: INESC TEC, Porto, Portugal

Maintenance stipend: € 651.12, 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:

- broaden the knowledge of the state of the art in emerging wireless networks;
- identify and select the methodologies and approaches most suitable for the development of the work;
- strengthen the research and development competencies of the grant holder through the application of the selected methodologies and approaches;
- critically assess the research process and evaluate the results obtained.

3. BRIEF PRESENTATION OF THE WORK PROGRAMME AND TRAINING:

The four Research Initiation Grants to be awarded are divided into four different Research Topics (#1 through #4), having individual Work Programmes, Preference Factors and Minimum Requirements. The applicants must reference, in the motivation letter, the specific Research Topic they are applying to.

The Work Programmes of each Research Topic are listed below:

Research Topic #1 – Data-rate Adaptation for Emerging Wireless Networks
- survey and analyze the state of the art in emerging wireless networks, including simulation aspects;
- collaborate in the preparation of technical reports on the algorithms, mechanisms, models, or protocols developed;
- collaborate in the development of new data-rate adaptation solutions for communications in extreme

environments;
- contribute to co-authored scientific publications within the scope of the work developed;
- prepare the research grant activity report.

Research Topic #2 – Semantic Communications in RF Links
- Study and analyze the state of the art in semantic communications and image transmission mechanisms using Regenerative Artificial Intelligence;
- Develop a prototype for image transmission based on regenerative AI semantics;
- Integrate and test the solution with an emulated HF testbed;
- Collaborate in the writing of technical reports regarding the protocols, mechanisms, and algorithms developed;
- Co-author scientific publications based on the work developed;
- Prepare the research grant activity report.

Research Topic #3 – Video Transmission using Semantic Communications and Generative AI
- Study and analyze the state of the art in semantic communications and video transmission mechanisms using Generative Artificial Intelligence;
- Develop a prototype for video transmission based on regenerative AI semantics;
- Evaluate the solution in a laboratory environment;
- Collaborate in the writing of technical reports regarding the protocols, mechanisms, and algorithms developed;
- Co-author scientific publications based on the work developed;
- Prepare the research grant activity report.

Research Topic #4 – A Compact Mobile Communications Cell Prototype
- survey and analyze the state of the art in emerging wireless networks, including simulation aspects;
- collaborate in the preparation of technical reports on the algorithms, mechanisms, models, or protocols developed;
- collaborate in the development of new communications solutions for extreme environments;
- contribute to co-authored scientific publications within the scope of the work developed;
- prepare the research grant activity report.

4. REQUIRED PROFILE:

Admission requirements:
Student in Electrical Engineering, Informatics 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:
The four Research Initiation Grants to be awarded are divided into four different Research Topics (#1 through #4), having individual Work Programmes, Preference Factors and Minimum Requirements. The applicants must reference, in the motivation letter, the specific Research Topic they are applying to.

The Preference Factors of each Research Topic are listed below:

Research Topic #1 – Data-rate Adaptation for Emerging Wireless Networks
- Solid knowledge of Wi-Fi wireless networks;
- knowledge of discrete event simulation, in specific, of ns-3.

Research Topic #2 – Semantic Communications in RF Links
- Solid knowledge of computer networks, namely the various protocol layers of the OSI model;
- Knowledge of IEEE 802.11 networks and narrowband HF links.

Research Topic #3 – Video Transmission using Semantic Communications and Generative AI
- Solid knowledge of computer networks, namely the various protocol layers of the OSI model
- Knowledge of IEEE 802.11 networks and video-to-text and text-to-video conversion algorithms.

Research Topic #4 – A Compact Mobile Communications Cell Prototype

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- research experience in the field of wireless networks/telecommunications;
- experience with Open RAN-based implementations such as OpenAirInterface, including the integration with Software Defined Radio (SDR) and/or commercial Radio Units (RUs);
- hands-on experience in designing and assembling hardware-based electronic/RF systems;
- experience in applying Artificial Intelligence/Machine Learning and/or optimization algorithms to wireless networking systems.

Minimum requirements:

The four Research Initiation Grants to be awarded are divided into four different Research Topics (#1 through #4), having individual Work Programmes, Preference Factors and Minimum Requirements. The applicants must reference, in the motivation letter, the specific Research Topic they are applying to.

The Minimum Requirements of each Research Topic are listed below:

Research Topic #1 – Data-rate Adaptation for Emerging Wireless Networks
- solid knowledge of the TCP/IP stack and Linux;
- proven experience in programming with C++ and/or Python;
- research and development experience in the field of computer networks;
- solid knowledge on PHY rata adaptation algorithms for Wi-Fi networks.

Research Topic #2 – Semantic Communications in RF Links
- Solid knowledge of the TCP/IP protocol stack and Linux.
- Programming experience using C++ and Python.
- Research experience in the area of semantic communications and narrowband links.

Research Topic #3 – Video Transmission using Semantic Communications and Generative AI
- Solid knowledge of the TCP/IP protocol stack and Linux;
- Programming experience using C++ and Python;
- Research experience in the area of semantic communications and Generative Artificial Intelligence.

Research Topic #4 – A Compact Mobile Communications Cell Prototype
- solid knowledge of the TCP/IP stack and Linux;
- fundamentals of wireless communications technologies, such as IEEE 802.11 (Wi-Fi), 5G, and IoT;
- proven experience in programming with C++ and/or Python.

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, 10%), Experience (EX, 30%) 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 (90%) and EI (10%).

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: Hélder Martins Fontes
Full member: Rui Lopes Campos
Full member: André Filipe Coelho
Substitute member: Filipe Borges Teixeira

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 not having benefited from any other research fellowship (Article 5, no. 5)
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 2025-12-04 to 2025-12-18

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