

**Opening notice of the Competition for attribution of one Research Initiation
Scholarships (BI)**

Reference: UIDB/05583/2020-BI-4M-5E

A call is now open for the attribution of one Research Initiation Scholarships (BI) within the scope of the Research Center in Digital Services (CISeD) in the Polytechnic Institute of Viseu, with reference UIDB/05583/2020-BI-4M-5E, funded by national funds, through the FCT/MCTES, under the funding granted by the Foundation for Science and Technology (FCT), within the scope of the Regulation for the Multiannual Assessment and Financing of R&D Units, under the following conditions:

1. Financing Sources: The project is financed through funds from FCT/MCTES, under project with reference UIDB/05583/2020

2. Scientific Area: Electrical Engineering

3. Admission requirements: Students enrolled in a master's program in Electrical Engineering, graduates in the field of Electrical Engineering, or individuals with a non-degree course integrated into the educational project of a higher education institution, developed in association or cooperation with one or more R&D units.

If a foreign higher education institution is awarded the degree, it must comply with the provisions of National Decree-Law No. 66/2018 of August 16 and Ordinance No. 33/2019 of January 25.

4. Hiring Requirements:

4.1. At the time of hiring, a document proving acceptance by the host institution, ensuring the necessary conditions for the proper development of the work, must be submitted;

4.2. At the time of hiring, the candidate must meet one of the following conditions:

a) Be enrolled in a master's program in the field of Electrical Engineering;

- b) Be enrolled in a non-degree course integrated into the educational project of a higher education institution, developed in association or cooperation with one or more R&D units.

5. Preferred Conditions: The preferred conditions are:

- Good communication skills and fluency in oral and written Portuguese and English;
- Initiative, ambition, and motivation to work in a team;
- Experience in electrical installations (design, installation, measurement of installations, and interpretation of single-line diagrams);
- Training in electric power quality;
- Training in solar photovoltaic generation;
- Training in installations with electric vehicles (EVs) charging stations.

6. Work Plan: To develop research activities to evaluate the quality of electric power in electrical installations, mainly residential, considering emerging scenarios, specifically the presence of EVs and renewable energy production. The disturbances in the voltage wave quality that may affect the production of electrical energy and the objective of self-consumption should be identified. Users of electrical infrastructures acquire production equipment but, in many cases, cannot achieve self-consumption. This aspect has caused complaints to the distribution entities. Additionally, it is important to analyze the voltage wave profile of users with these characteristics to qualify the profile and understand the origin of potential disturbances in the voltage wave quality.

To develop research activities to evaluate the quality of electric power in electrical installations, mainly residential, considering emerging scenarios, specifically the presence of electric vehicles (EVs) and renewable energy production. The disturbances in the voltage wave quality that may affect the production of electrical energy and the objective of self-consumption should be identified. Users of electrical infrastructures acquire production equipment but, in many cases, cannot achieve self-consumption. This aspect has caused complaints to the distribution entities. Additionally, it is important to analyze the voltage wave profile of users with these characteristics to qualify the profile and understand the origin of potential disturbances in the voltage wave quality.

The objectives are:

- 1) To analyze specific cases of installations with a diagnosis at the level of power quality;
- 2) To identify potential problems impacting the management of respective self-consumption;
- 3) To indicate potential problems/advantages arising from the presence of EVs at consumption points;
- 4) To analyze the quality of the voltage wave from the electric grid to identify potential issues as outlined in the NP EN 50160 standard. Measurement equipment, if available, may include: - Power quality analyzers; - On-board diagnostic (OBD) tools; - EVSE (Electric Vehicle Supply Equipment).

Summary Timeline:

- 1) Review of standards related to power quality; 2) Analysis of power quality reports at the level of distribution electric grids; 3) Laboratory study of measurement equipment;
- 4) Measurement of power quality in utilization installations; 5) Data analysis from delivery points requested from the distribution entity; 6) Diagnostics, results, and discussion.

This research aims to contribute to science, electrical installation owners, and network operators, as they must ensure the "electricity" product complies with European standards such as NP EN 50160. The work is part of Project PIDI/CISeD/2023/013, Sustainable Mobility Practices, task 2: assessing the voltage wave quality in energy utilization installations.

7. Applicable legislation and regulations: Law No. 40/2004 of August 18, which approves the Research Fellowship Statute, amended by Decree-Law No. 202/2012 of August 27, by Law No. 12/2013, of January 29, Decree-Law No. 89/2013, of 9 July and Decree-Law No. 123/2019 of 28 August, FCT Research Grant Regulation, available at and <https://www.fct.pt/apoios/scholarships/regulamento.phtml.pt> and Regulation of Research Scholarships of the Polytechnic Institute of Viseu, published in Diário da República, no. 112, 2nd series, of 9 June 2020.

8. Workplace: The work will primarily be conducted at the facilities of the Polytechnic Institute of Viseu, in the laboratories of ESTGV and CISeD, and at the electrical energy utilization sites where measurements and data collection will be performed. The candidate must have the means to travel to the locations where energy measurements will be taken

within the Viseu region. The work will be carried out under the scientific supervision of Professor Eduardo Miguel Teixeira Mendonça Gouveia.

9. Scholarship duration: The scholarship will last for 6 months, possibly renewable, and cannot, in any case, exceed the end of the financing.

10. Amount of monthly maintenance allowance: The amount of the scholarship will be €990.98, according to the table of scholarship values in force established for this type of scholarship by the FCT (BI), https://www.fct.pt/wp-content/uploads/2024/02/Tabela-de-Valores-SMM_atualizacao-2024.pdf

11. Selection methods:

Selection and ranking are based on curriculum evaluation and an interview.

The final evaluation results from the weighted average of the curriculum evaluation and interview evaluation according to the following criteria and respective weights:

a) Academic qualifications (Maximum of 20 points, weight of 40%):

- a.1) Grade from the undergraduate degree (points = grade from undergraduate degree);
- a.2) Bonus points if enrolled in a master's program in the field of the competition (+3.0 points);

b) Research experience (Maximum of 20 points, weight of 10%):

- b.1) Article where the candidate is the 1st author or corresponding author, published or demonstrably accepted (e.g., available online, DOI) (4.0 points each);
- b.2) Presentation of papers at conferences (2.0 points each);

c) Professional experience in the areas related to the competition (Maximum of 20 points, weight of 20%):

- c.1) Months of professional experience (1.0 points each);

c) Interview (Maximum of 20 points, weight of 30%):

On a scale of 0 to 20 points, the interview will assess:

- Communication skills and fluency in oral Portuguese and English;
- Proficiency in photovoltaic solar production systems;
- Understanding of disturbances in electrical networks related to electrical power quality;
- Knowledge of electrical installation design;
- Knowledge of EV charging stations;
- Initiative, ambition, and motivation to work in a team, as well as autonomy and critical thinking to carry out assigned research activities.

12. Composition of the Selection Jury:

President: Professor Eduardo Miguel Teixeira Mendonça Gouveia of Escola Superior de Tecnologia e Gestão de Viseu;

Effective Vowel: Professor Vasco Eduardo Graça Santos of Escola Superior de Tecnologia e Gestão de Viseu;

Effective Vowel: Professor Maria Elisabete Ferreira Silva of Escola Superior de Tecnologia e Gestão de Viseu;

Substitute Vowel: Professor Steven Lopes Abrantes of Escola Superior de Tecnologia e Gestão de Viseu.

13 Publication/Notification of Results: The final selection process results will be announced in a ranked list posted in a visible and public location at the Central Services of the Polytechnic Institute of Viseu; notifications to candidates will be made via email.

By the decision of the jury, a reserve list of candidates may be established, valid for 18 months after the conclusion of the selection process. The final results are always subject to compliance with the provisions of the Research Fellowship Statute. Any appeals against the jury's final decision must be submitted within 15 business days from the respective notification, as stipulated in Article 10 of the Research Fellowship Regulations of the Polytechnic Institute of Viseu.

14. Contract and final report: The contract and final report templates to be prepared by the grantee and the supervisor are those attached to the Research Fellowship Regulations of the Polytechnic Institute of Viseu (IPV)

15. Submission Deadline and Submission Method:

The call for applications is open from 14/11/2024 to 25/11/2024, and only applications submitted within the specified period will be considered.

16. Requirements must be submitted exclusively via email to ipv_nbolseiro@sc.ipv.pt, indicating the scholarship reference in the subject line (UIDB/05583/2020-BIL-4M-5E), accompanied by the following documents:

- a) Certificates proving academic qualifications;
- b) Detailed Curriculum Vitae, including phone number, email address, and any relevant documents considered by the candidate;
- c) Proof of enrollment/registration in a master's program, if currently enrolled, or alternatively, proof of enrollment/registration in a non-degree course as mentioned in points 4.2(b) or (c) of this notice (Documents for this item may be submitted to the President of the Jury up to 30 days after the application deadline).

The selection and ranking are conditional and will only lead to effective hiring if the candidate has submitted all necessary documents for employment by the deadlines specified in this notice, including those mentioned in point 4 of this notice.

The Vice-President of Instituto, Professor Helena Maria Vala Correia