JOB ADVERTISEMENT

Hiring of 1 (one) Assistant Researcher in the Area of power electronics and hybrid AC/DC grids

INESC TEC – Institute for Systems and Computer Engineering, Technology and Science, a private research institution, is accepting applications to hire an **Assistant Researcher with an open-ended contract** to join the Energy Systems Center (CPES).

This notice complies with the FCT-Tenure Programme – First Edition, published within the scope of the *Aviso de Abertura de Concurso*, reference PRR no. 02/C06-i06/2024, with the objective of promoting the hiring of PhD candidates exclusively for permanent positions, integrating them in research careers. The object of this notice has the reference 2023.14760.TENURE.021 and was approved in said call.

The hiring process will comply with the Labour Code Law and other legislation applicable to individual employment contracts, as well as the internal rules of INESC TEC.

The FCT-Tenure Programme funding is applicable only to PhD holders who do not benefit from permanent or open-ended employment contracts and who have been - or are - on fixed-term contracts or grants, as PhD holders, at an institution part of the national scientific and technological system.

SALARY LEVEL

According to INESC TEC's wage framework, the wage awarded is 3563.49€, corresponding to the initial remuneration position at level I2, similar to Assistant Researcher, according to the categories of the Public Scientific Research Career Statute, approved by the latest wording of Decree-Law 124/99 (April 20).

JOB DESCRIPTION, SCIENTIFIC PROFILE AND RATIONALE

Job Description:
The researcher will lead and participate in innovative research and development projects in industrial electronics specializing in power converters integrated into electric power systems in the topics of synthetic inertia, hybrid AC/DC grids, electric mobility integration, hybrid battery storage systems, and the production of green hydrogen. The responsibilities of the collaborator will involve the design, construction, and experimental validation of electronic power converter prototypes (hardware and control algorithms) related to the topics previously enumerated, implementation of electrical installations required to develop a laboratory-scale hybrid AC/DC distribution grid test-bed, the development of innovative algorithms for grid-forming inverters, synthetic inertia for grid-forming and grid-following inverters, control and operation of hybrid AC/DC grids incorporating distributed generation and EV charging. The collaborator is also expected to collaborate with academic and industrial partners. At last, the collaborator is also expected to perform training and supervision activities for undergraduate students in the power electronics power systems field.

Scientific Profile:
The collaborator must have a Ph.D. in Electrical Engineering (Power Electronics / Power and Energy Systems) or a closely related field, with a strong focus on designing and developing electronic power converters, including advanced architectures and control algorithms for power converters. A publication record in top-tier journals and conferences in the field is also required. The collaborator must demonstrate expertise in practical and theoretical aspects of designing and developing electronic power converters and electrotechnical work. The collaborator should also demonstrate a solid knowledge base related to computational simulation of electrical distribution grids and power converters, grid integration of electric vehicles and distributed renewable energy, and ancillary services in power systems related to frequency stability and inertia provision. At last, experience with grant writing for research and development projects, project management, and the ability to secure research funding constitutes a preferential aspect.

Rationale:
Important changes are looming in energy systems because of the progressive integration of distributed energy resources such as renewable energy sources (RES), transport electrification, and the expected proliferation of distributed energy storage and green hydrogen production. Among the expected impacts on current electric power systems are the need to at least partially redesign and reinforce transmission and distribution electric grids, the need to tackle the decrease of the power system's overall inertia due to the increasing share of power-conversion based RES such as wind and PV, and the need for effective load management approaches to accommodate the expected load imposed by transport electrification and hydrogen production. It is in this context that hybrid AC/DC distribution grids and advanced synthetic inertia emulation may constitute key enabling technological elements. Hybrid AC/DC distribution grids may offer a more efficient, cost-effective, and flexible solution for reinforcing, expanding, and even reformulating existing distribution grids to accommodate an increasing share of resources that are DC by nature (such as EV charging, battery energy storage technologies, hydrogen electrolysers, and PV generation) in locations where currently existing distribution grids have not enough capacity or are even totally absent. Synthetic inertia may provide a crucial response to the decreasing share of rotating synchronous generators in power systems, further fostering the integration of power-converter-based distributed energy resources.
Having a collaborator with a strong scientific profile in these subjects will enable our institution to remain at the forefront in these domains. This new addition to our staff would enhance our research capabilities in the stressed domains and our training capabilities for academic and industry partners, with the last goal of fostering innovation, technological advancement, and societal and economic impact. Thus, the proposed position is of utmost importance for the institution's reputation as a leader in power and energy systems education and research, contributing significantly to the development of cutting-edge solutions for the future paradigms of electric power systems.

WORK PLACE

INESC TEC, Porto, Portugal.

REQUIRED PROFILE:

National, foreigner and stateless candidates holding a PhD in Electrical Engineering (Power Electronics / Power and Energy Systems), or related scientific area, and who hold a scientific and professional CV that showcases a profile suitable for the position of Assistant Researcher and the position with reference 2023.14760.TENURE.021, described above.

FORMALISATION OF THE APPLICATIONS

The applications will be formalised by submitting a specific form in INESC TEC's website. The form is available in the icon "Apply now".

On the same form, each candidate must upload the following documents:

- **Motivation letter** for the job opening, addressed to the Chief Executive Officer at INESC TEC, including a plan of **activities and individual career development** for a maximum period of five years. The plan should demonstrate alignment with INESC TEC's strategy (check chapter no. 2 of INESC TEC's Activity Plan for the current year) and the duties to be performed, without exceeding 2000 words and no more than five pages.
- ***Curriculum Vita***, structured according to the F1-F4 criteria below, for the assessment of the respective relevance, quality, timeliness and adequacy, highlighting all the higher education and the scientific and technological results; the activities of basic, applied or practice-based research; teaching and students' supervision experience; activities of knowledge dissemination, and management of science activities over the past five years - considered by the candidate as more relevant or with greater impact.
- **Copy of certificates or diplomas**;

Note: Selected candidates with academic degrees obtained abroad must present, for contracting purposes, the records of recognition of said degrees and adequate compliance with the Portuguese grading systems (whenever their degree received a final grade), issued by the Directorate General for Higher Education or by a Portuguese public higher education institution, pursuant to Decree-Law no. 341/2007 (12 October) and Ordinance no. 227/2017 (July 25). As an alternative, they can include a document to recognise the validity of foreign grades and the corresponding Portuguese grades, issued by a Portuguese public higher education institution (process regulated by Decree-Law no. 283/83 [21 June]).

- **Other documents** that they consider relevant for the evaluation of the scientific and academic path.

Candidates who incorrectly submit their applications or who do not meet the demanded requirements will be excluded from admission.

The jury has the power to require any candidate, in case of doubt, to present documents proving their statements. False statements made by the candidates will be punished under the terms of the applicable legislation.

EVALUATION AND SELECTION PROCESS

The evaluation is carried out in two phases, which will result in a final classification between 0 and 100 points.

First phase: curricular assessment

The selection is made through the evaluation of the motivation letter, which will include the plan of activities and individual career development, and of the scientific and curricular journey - focusing on the generation of scientific results and professional activities **over the last five years (considered more relevant by the applicants)**. This five-year period may be extended by the jury, at the request of the candidate, if reasoned on suspension of the scientific activities for specific reasons, e.g., parental leave, serious illness, and other legally established cases that determine unavailability for work.

The scientific and professional CV of the candidate will be evaluated focusing on the relevance, quality and timeliness of the factors referred to below in the specific subject area(s), considering the specific requirements and the adequacy for the duties to be performed.

F1 - Production of scientific, technological, cultural or artistic results that the candidate considers relevant.
F2 – Applied or practice-based research activities considered to have the greatest impact by the candidate. This includes proven ability to establish national or international collaborations.
F3 - Teaching, supervision, extension and knowledge dissemination activities, namely in the context of the promotion of culture and scientific practices, that the candidate considers more relevant, with emphasis on proven ability to supervise junior researchers, post-doctoral fellows, or students.
F4 - Project and science, technology and innovation programmes management, or experience in observing, monitoring and evaluating the scientific, technological and higher education systems in Portugal or abroad. Emphasis is placed on proven ability to secure research funding and participate in the preparation and submission of science, technology and innovation proposals.
F5 - Motivation letter, including the plan of activities and individual career development, adequate and in compliance with the duties to be developed under the strategic project at INESC TEC.

The evaluation of all candidates in the first phase must be completed within a period of no more than one month after the applications are received.

Candidates shall be approved on absolute merit if they obtain at least 70 points in the curriculum evaluations from the majority of the jury members, except for the President, who votes only in the event of a tie.

The top five candidates - with the highest average and approved in absolute merit - will advance to the second stage, which features an individual interview, either face-to-face or online. The interview will represent a maximum of 10% of the final score.

Second phase: interview
The Jury will individually interview the candidates who advance to the second phase.

During the interview, the members of the Jury will encourage an open debate about the quality and the innovative and creative nature of the research and professional activities of the candidates, considering the requirements and the areas of the open position.

The interviews will take place within a period not exceeding 10 working days after the decision of the Jury.

FUNCTIONING OF THE JURY

Each member of the Jury will assess all the candidates according to the criteria mentioned before (from F1 to F5), following a 0 and 100 score system; they must present the reasoning for their scores. Abstention is not allowed in this process.
The same applies to the candidates selected for the interview process.
The candidates who are not selected for interview will receive 0 points for the second stage.

The curricular assessment (AC) of each candidate stems from the average of the factors (Fi) multiplied by the relevance coefficients for the specific position, as provided below.

$$AC = 0.2*F1 + 0.2*F2 + 0.2*F3 + 0.1*F4 + 0.3*F5$$

The final score (CF) stems from the average of the curricular assessment and the interview (E), multiplied by the relevance coefficients, as provided below.

$$CF = 0.9*AC + 0.1*E$$

After completing the application of the selection criteria, each member of the Jury will sort the candidates according to the final score. On the basis of these rankings, the Jury will rank the candidates in succession for the first and subsequent places (each member of the Jury follows their personal order). The candidate who gets more than half the votes will be selected. If this does not happen in the first vote for a particular seat, the least voted candidate is eliminated, and the procedure is repeated with the others. The President of the Jury only votes in case there is a tie.

The Jury shall recommend the hiring of the candidate approved on absolute merit and ranked in first place. If this candidate does not accept the position, the Jury shall recommend the next-ranked candidate, and so on, until the position is accepted.

Minutes are drawn up of the Jury's meetings, which contain a summary of what took place, as well as the assessments made by each of the members and the reasons for them - and they must be available to the candidates when requested.

SELECTION JURY
The jury is composed of:

President of the Jury: Carlos Coelho Leal Monteiro Moreira, Associate Professor, Faculty of Engineering, University of Porto and INESC TEC.
Full Member: Ricardo Jorge Gomes de Sousa Bento Bessa, Principal Researcher, INESC TEC.
Full Member: Rui Manuel Esteves Araújo, Associate Professor, Faculty of Engineering, University of Porto and INESC TEC.
External Full Member: Sónia Pinto, Associate Professor, Instituto Superior Técnico, University of Lisbon.
External Full Member: André Manuel dos Santos Mendes, Associate Professor, University of Coimbra.

APPLICATION PERIOD

Applications must be submitted by 23:59 on 2025-07-25.

NOTIFICATION OF THE RESULTS, PRIOR HEARING AND FINAL DECISION OF THE RESULTS

The results of the selection process will be disclosed to the candidates by email.

After being notified, the candidates have 10 working days to comment on the results of the selection process under their right to a preliminary hearing. The final decision of the Jury will be given within 10 days from the deadline for the decision under the right to a prior hearing.

The present call is exclusive to the open position, expiring after the selection of the top candidate.

NON-DISCRIMINATION AND EQUAL ACCESS POLICY

INESC TEC actively promotes a policy of non-discrimination and equal access, so that no candidate can be privileged, benefited, harmed or deprived of any right or exempted from any duty, on basis of origin, age, sex, sexual orientation, marital status, family or economic status, education, social origin or condition, genetic heritage, reduced capacity for work, disability, chronic illness, nationality, ethnic origin or race, region of origin, language, religion, political or ideological convictions and trade union membership.

Candidates with disabilities will be selected over others, in case of equal final score. The degree of disability is mandatorily proven through the presentation, in an application, of the Medical Certificate of Multipurpose Disability (AMIM), issued under the terms of Decree-Law no. 202/96 (October 23), in the latest wording.

The Executive Commission of INESC TEC approved this job advertisement in the meeting of 2025-07-10, also being responsible for the final decision on hiring.