(BL135/2025)

Research Studentships (for Master or Integrated Master students)

Applications are open for 3 Research Studentship, within the Recovery and Resilience Plan (RRP) project "Alliance for the Energy Transition", under the following conditions:

Scientific Area: Electrical and Computer Engineering

Admission Requirements: *To be enrolled at an integrated master or a master.*

Workplan: Industrial electrical networks rely heavily on the quality of the energy supplied to them. Failures in low-voltage cables or active equipment within the network can also lead to interruptions in machine operation and overall factory production. Within the scope of this fellowship, functions will be developed to detect service quality breakdowns based on virtual models of the distribution transformer (digital twin), to the degree they result in the shutdown of electric machines and manufacturing processes.

The outcome will be a commercial toolbox integrated into Eneida Deepgrid, a software solution for managing private low-voltage electrical networks. Some of the functions that will be incorporated into this software include:

1) Detection of service quality violations that may interrupt machine operation and production processes;

2) Classification of industrial equipment and fault localization functions, based on methods that are already studied and understood, but not yet computationally optimized or operational in real time;

3) Power quality management functions that enable the participation of distributed resources to compensate for energy quality degradation and mitigate production losses;

4) Detection of intrusion attempts and prevention of breaches in command and control information security.

Legislation and Regulations: Statute of Scientific Research Fellow, approved by Law nr. 40/2004, of August 18, as worded by Decree-Law nr. 123/2019, of August 28; IST Regulation of Scientific Research Fellowships, available on https://drh.tecnico.ulisboa.pt/files/sites/45/despacho_8532_regulamento_bolsas.pdf

Workplace: The work will be developed at Instituto de Engenharia Mecânica (IDMEC) under the scientific supervision of Professor Paulo José da Costa Branco, Professor João Filipe Pereira Fernandes and Dr. Andrés Alejandro Zúñiga Rodríguez

Duration: The research fellowship(s) will have a duration of 09 months. It's expected to begin in October/2025, and the contract is not renewable.

Monthly maintenance allowance: the amount of the monthly maintenance allowance is €1040,98, being the payment method an option of the Fellow by Wire Transfer.

Selection methods: The selection methods to be used will be as follows: curriculum evaluation (academic background, currently master's grade, suitability for the role) and motivation letter, with corresponding weightings of 50%, 25%, and 25%, respectively. The criteria will be assessed on a scale from 1 to 10.

Composition of the selection Jury: President: Prof. Paulo José da Costa Branco; Effective members: Prof. João Filipe Pereira Fernandes and Dr. Andrés Alejandro Zúñiga Rodríguez

Announcement/ notification of the results: The final evaluation results will be communicated to all applicants by email.

Deadlines and procedures of complaint and appeal. A complaint may be lodged from the final decision within 15 working days, or an appeal to the Executive Board of IST within 30 working days, both counted from the respective notification

Application deadline and formalization: The call is open from September 29 until October 10, 2025.

It is mandatory to formalize applications with the submission of the following documents: i) B1 Form – Fellowship application (http://drh.tecnico.ulisboa.pt/bolseiros/formularios/); ii) *Curriculum Vitae*; iii) academic degree certificate, where applicable; iv) proof of enrollment at an academic degree course (Master, Integrated Master); v) motivation letter;

Applications must be submitted to the email *pbranco@tecnico.ulisboa.pt* ,including the reference of the Call Notice (Unique identifier) in the subject line of the email.