(BL157/2026-IST-ID)

Research Studentships for PhD students

Applications are open for 1 (one) Research Studentship, within the framework of project **PREDICT – Probabilistic Real-time Estimation of Discharges Integrated with Cutting-edge Transformers** (**LISBOA2030-FEDER-00856400** | 1801P.01563), IST-ID, Associação do Instituto Superior Técnico para a Investigação e Desenvolvimento, financed by national funds through **FCT/MCTES** (PIDDAC) and co-financed by the European Regional Development Fund (FEDER), under the Regional Program Lisboa 2030, under the following conditions:

Scientific Area: Hidráulica, Ambiente e Recursos Hídricos (Hydraulics, Environment and Water Resources).

Admission Requirements: Applicants must hold a Master's degree in Civil Engineering, Environmental Engineering, or a closely related field, and be enrolled in a PhD programme.

The ideal candidate should have:

- A solid background in hydrology and water resources.
- Programming experience, preferably in Python (experience with scientific libraries such as NumPy, pandas, xarray or PyTorch is valued).
- Knowledge of databases (e.g., SQL/PostgreSQL) and version control (e.g., Git).
- Experience with hydrometeorological data (ground observations, reanalyses or numerical weather prediction products) and/or hydrological models will be considered an asset.
- Familiarity with web services and APIs, containerisation (e.g., Docker).
- Good scientific writing skills and proficiency in spoken and written English.
- Strong problem-solving abilities, with the capacity to work both independently and as part of a multidisciplinary team that includes external partners.

Workplan: The candidate will develop activities within the PREDICT Scientific Research & Technological Development Project, a collaboration between IST, the Portuguese Environment Agency (APA) and the Portuguese Institute for Sea and Atmosphere (IPMA), which aims to set up a probabilistic streamflow forecasting and decision-support system for Portugal based on state-of-the-art machine learning models (e.g., Temporal Fusion Transformers). The work will focus mostly on the operationalization of streamflow forecasting systems, i.e., on turning trained models and probabilistic methods into a reliable, automated forecasting chain running in real time. The key topics (and the candidate's potential line of research) are:

- Co-development of the operational probabilistic forecasting pipeline, including the automated acquisition, validation and pre-processing of hydrometeorological observations and meteorological forecasts.
- Bias correction of meteorological forecasts to ensure consistency with the datasets used for model training, taking lead-time dependencies into account.
- Integration of deep learning models (Temporal Fusion Transformers) and statistical uncertainty models (Generalized Pareto Uncertainty) into the operational forecasting chain.
- Deployment, testing and monitoring of the online forecasting platform (building upon the Tethys Forecasting System), including forecasting and decision-support modules.
- Verification of operational forecasts using probabilistic performance metrics (e.g., CRPS, reliability, resolution).

The main tasks of the candidate are expected to be:

- Research (literature review and new advancements, including programming and software development).
- Development of scientific skills (e.g., by attending relevant courses).



- Preparation of publications in international peer-reviewed journals and participation in specialized conferences (talks / posters).
- Documentation, reporting and representation associated with PREDICT, in collaboration with the project partners (APA and IPMA).

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; FCT Regulation for Research Studentships and Fellowships, available on https://dre.pt/application/file/a/127230968 .

Workplace: The work will be developed at Instituto Superior Técnico (IST-ID, Associação do Instituto Superior Técnico para a Investigação e Desenvolvimento), associated with the CERIS (Civil Engineering Research and Innovation for Sustainability) research center, under the scientific supervision of Professor José Pedro Matos.

Duration: The research studentship will have a duration of 6 months, scheduled to start in January 2027, and may be renewed up to a maximum of 18 months (until June 30, 2028, end date of the project), including the duration of the initial contract.

Monthly maintenance allowance: According to the values for Research Fellowships awarded by FCT in Portugal (https://www.fct.pt/fct-atualizou-o-valor-das-bolsas-para-2026/), the amount of the monthly maintenance allowance is 1359,64€, being the payment method an option of the Fellow by Wire Transfer.

Selection methods: The selection methods will be the following: analysis of the academic record (50%: M.Sc. grade – 20%; grades in Hydrology and Water Resources courses, or equivalent – 15%; grades in Probability and Statistics, or equivalent – 15%) and individual interview (50%, in person or online, to be scheduled with the jury). In the interview, programming skills, experience with hydrometeorological data and automated/operational workflows, proficiency in the English language and motivation for the topic, among other hard and soft skills, will be valued.

Composition of the selection Jury:
Prof. José Pedro Gamito de Saldanha Calado Matos – nº mec. IST151906
Prof. Rodrigo De Almada Cardoso Proença de Oliveira – nº mec. IST126343
Prof. Diogo Silva Mendes – nº mec. IST176657

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-ID within 30 working days, both counted from the respective notification

Application deadline and formalization: The call is open from October 26 until November 23, 2026.

It is mandatory to formalize applications with the submission of the following documents: i) B1 Form – Fellowship application (https://ist-id.pt/recursos-humanos/bolseiros/#documentos-relacionados); ii) *Curriculum Vitae*; iii) academic degree certificate, where applicable; iv) proof of enrollment in a PhD programme (or proof of application, if enrollment is not yet completed); v) motivation letter.

Applications must be submitted by email to jose.matos@tecnico.ulisboa.pt , with gabriela.cunha@tecnico.ulisboa.pt in copy.