

JOB VACANCY ANNOUNCEMENT

VAC-2025-65 – PhD position on AI-driven Structural Health Monitoring and Safety Assessment of Dams (FPI 2024)

Number of places: 1

Category: PhD Student - PHD 1

Workplace: CIMNE Madrid

Salary (gross): 24.468,15€¹

Weekly working hours: 40 hrs/week

Contract type: PhD

Duration: 4 years

Planned start date: January 1st, 2026²

Functions to be developed:

A doctoral thesis in the framework of the research project entitled DAMSHAI: Dam Structural Health Monitoring and Safety Assessment with an AI-driven framework, with reference *Project PID2024-157828OB-I00 funded by MCIN/AEI/10.13039/501100011033 and by FEDER, EU*, funded by the Spanish Proyectos de Generación de Conocimiento 2024. Principal investigator: Dr. Fernando Salazar (<https://sites.google.com/view/fernando-salazar-gonzalez>).

The DAMSHAI project explores the potential of AI agents to support decision-making in dam safety and predictive maintenance, integrating numerical modelling (FEM), monitoring data, machine learning (ML) predictions, and expert knowledge.

Tasks to be performed:

- Contribute to the generation of a knowledge base, integrating monitoring data, FEM models, technical reports, and expert surveys.
- Participate in the evaluation of AI approaches (prompt engineering, fine-tuning of LLMs, and rule-based expert systems) for decision support in dam engineering.

¹ The annual salary will be 24,468.15€ for each of the four years.

² This date is subject to the adjustment of the final concession resolution.

- Develop methods for integrating heterogeneous data (numerical, categorical, textual) into an AI-agent for anomaly detection and safety assessment.
- Collaborate in the design, implementation, and validation of a prototype AI-agent applied to a real case study of dam behavior.
- Prepare and publish scientific results in leading international journals and conferences.

Additional information about the project is available at: CIMNE RTD Project: [DAMSHAI](#)

The candidate will join the Machine Learning in Civil Engineering group at CIMNE Madrid, in collaboration with UPC and international partners (Portugal, USA, Ecuador).

This contract is financed by the announcement of Proyectos de Generación de Conocimiento 2024 of the Ministerio de Ciencia, Innovación y universidades: Proyectos de Generación de conocimiento 2024| Agencia Estatal de Investigación (www.aei.gob.es).

Required skills:

- Master's degree (or equivalent) in Civil Engineering, Structural Engineering, Computational Mechanics, Computer/Data Science, or related fields; eligible for enrolment in a PhD programme.
- Solid programming skills (Python preferred).
- Background in numerical modelling (FEM) and machine learning / AI.
- Good written and oral communication skills in English.

Other valued skills (not mandatory):

- Knowledge of dam engineering or structural safety.
- Experience with ML frameworks (TensorFlow, PyTorch, Scikit-learn, etc.).
- Experience in high-performance computing environments.
- Analytical skills, autonomy, and motivation for interdisciplinary research.
- Spanish or Catalan language skills.

Qualification system:

The evaluation process must comply with the following criteria and sub-criteria:

1. Criterion Academic and/or scientific-technical track record of the candidate (up to 50 points).
 - Scientific-technical contributions (up to 45 points). The candidate's academic record and other curricular merits will be assessed, as well as their relevance to the tasks to be carried out, considering the candidate's training and professional experience.
 - Mobility and internationalization (up to 5 points). The relevance and impact on the candidate's research career of stays in national and international centers and/or in the industrial sector

will be assessed, taking into account the prestige of the host institution and the activities carried out there.

2. Criterion 2. Suitability of the candidate for the research activities to be carried out (up to 50 points).
The candidate's suitability for the program, project, or research activities to be carried out will be assessed based on their prior training and experience. Consideration will be given to the added value that undertaking the project will represent for the candidate's research career, as well as the value contributed to the host center and team.

Candidates must complete the "Application Form" form on our website, indicating the reference of the vacancy and attaching the required documents.

The deadline for registration to the offer ends on October 16th, 2025 at 12 noon.

The preselected candidates may be requested to send the documentation required in the "Requirements" and "Merits" sections, duly scanned, and may be called to go through selection tests (which might be of eliminatory nature) and / or personal interviews.

***It is mandatory to provide the CV in the official form of the Spanish Ministry, which can be downloaded from the following link: <https://www.cimne.com/cvdata/cntr2/spc2/dtos/mdia/People/CV-abreuja.pdf>**

Commitment to inclusivity:

At CIMNE, we champion workplace equity, diversity, and inclusion. We're committed to fostering a culture where everyone can thrive, leveraging diverse talents and backgrounds. We welcome all applicants regardless of color, religion, gender, origin, abilities, gender identity, sexual orientation, pregnancy or any other characteristic. Join us in building a community that values, celebrates, and respects every individual.

Quota Reservation:

In line with our commitment to inclusion, we reserve a percentage of our workforce for people with disabilities. We especially encourage these individuals to apply.

HR Excellence in Research:

CIMNE welcomes and supports the principles of European Commission's [European Charter for Researchers](#) and the [Code of Conduct for the Recruitment of Researchers](#), embracing a transparent, attractive, and open labour market in research. The centre's Human Resources Strategy for Researchers (HRS4R) includes an action plan with actionable short and long-term actions to support a high-quality working environment for all. Further information can be found [here](#).

Reference to the research project funded by

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