Interested in earning a PhD degree in Wind Energy while working in an AI startup company in Portugal?
If the answer is YES, please [APPLY](#) to Inductiva Research Labs.

Application Deadline was EXTENDED until December 31 at 17:00 (Portugal Time zone).

Job Position: PhD in Flow Over Complex or Forested Terrain: Physical versus Data-based Modelling.

The **Engineering Faculty of the University of Porto (FEUP)** and **Inductiva Research Labs** invite applications for a position as an industrial Doctoral Candidate (DC) in the intersection between simulation and machine learning to develop new approaches in the modelling of flow over complex or forest terrain, as a part of the AptWind Marie Skłodowska-Curie Doctoral Network. We are extending to you the chance to be involved in a program designed not only to assist 15 Doctoral Candidates (DCs) in achieving exceptional technical and project-related proficiency but also to equip you with a range of skills applicable to a wide array of career prospects.

Your work allocation will be spent 100% at Inductiva Research Labs and you will be enrolled in FEUP´s [Doctoral Program in Mechanical Engineering](#). You will be jointly supervised, ensuring a comprehensive comprehension of the research-to-industry implementation process. Upon program completion, you will possess a deep understanding of this journey and gain access to a robust career-enhancing network.

Offer description

Your research work will involve identifying and classifying major wind patterns and creating datasets based on state-of-the-art numerical simulators. Using this data, you will focus on the implementation and training of machine learning models for different scenarios of flow over complex terrains and compare the results to classical simulators.n according to the below work description:

1) Assess and analyse publicly available datasets (e.g., Perdigão-2017 https://perdigao.fe.up.pt/) to identify and classify major wind patterns representative of different regions and weather conditions.
2) Create publicly available datasets containing the results of large-scale simulations of several variations of the use-cases under study computed with state-of-the-art numerical simulators that can be used for

training and validating ML models in this project as well as for the benefit of the broader research community.

3) Implement a detailed architecture of physically informed Machine Learning methods and corresponding evaluation for the use cases under study.

4) Build pre-trained ML models capable of generalising to different scenarios of complex terrain to be readily used by partners directly or via an API.

5) Study the limitations and advantages of ML models compared to classical simulators and the estimation of error margins; Catalogue of pathological case scenarios for both classic and ML methods.

6) Generate models for predicting calibration parameters of classical simulators based on existing measured data.

Being part of this AptWind project together with other 14 Doctoral Candidates you'll also have the chance to receive advanced training at multiple European universities and engage in enriching scientific discussions.

Criteria for this position are:

- Completed masters-level degree in Computer Science, Software Engineering, Physics, Mechanical Engineering, Mathematics, and similar fields by Fall 2023;
- Proficiency with scientific programming languages such as Python;
- English language-level B2 or above;
- Not have been awarded the title of PhD;
- Not have carried out work in Portugal for more than 12 months during the last 3 years.

For more information about eligibility criteria please consult www.aptwind.eu/eligibility. We will not be able to employ you if you do not fulfil the criteria.

Salary
You will be compensated following local rules for Doctoral Researchers and the rules Marie Sklodowska-Curie Actions Doctoral Networks - Industrial Doctorates. The period of employment is 3 years.

Further information
For further information get in touch with Clara Gonçalves, tel.: +351 912195236, or send an email to careers@inductiva.ai.

Application procedure
Your complete online application must be submitted no later than **31 December 2023 (17:00 Portuguese time).**

To apply, please use the link **"Apply Now"**, submit, and attach all your materials in English in a file with your name. The file must include:
>   **1** - A letter motivating the application (cover letter)
>   **2** - Curriculum vitae
>   **3** - Grade transcripts and BSc/MSc diploma (in English), including an official description of the grading scale.
>   **4** - Relevant publications

The application process follows the Euraxess Code of Conduct for Recruitment and will include diverse methods to understand candidates' strengths and weaknesses. Applications received after the deadline will not be considered. All interested candidates, irrespective of age, gender, race, disability, religion, or ethnic background, are encouraged to apply.

Placement: Research and Machine Learning Department
Type of employment: Full-time, Temporary position

Pay: Fixed salary

Number of positions: 1

Working regime: full-time and exclusive

Town: Porto

Country: Portugal

Representative: Clara Gonçalves, tel.: +351 912195236, email to careers@inductiva.ai.

Last application date: 2023-11-30 (now extended to 2023-12-31)

About AptWind Project:

The AptWind Doctoral Network provides training for a new creative, entrepreneurial, innovative, and resilient industry-oriented academic generation apt to face current and future challenges at the frontier of research within atmospheric flow physics and turbulence for wind energy applications, where the trained Doctoral Candidates (DCs) will be able to convert knowledge and ideas into new products, and services for economic and social benefit.

Aptwind is funded by Horizon Europe - Marie Sklodowska-Curie Actions Doctoral Networks - Industrial Doctorates, through grant number 101119550.
See **www.aptwind.eu** for more information.

About FEUP:

FEUP is a leading Engineering institution focused on the creation, transmission and dissemination of knowledge, technology and culture in engineering, and has, as a major component, the preparation of youngers to pursue the engineering profession at an international level, supported by Research and Development of excellence, contemplating the strands scientific, technical, ethical and cultural.

At FEUP you will benefit from a long-standing scientific activity on studying atmospheric flows of interest to wind energy, involving analysis of field data and computational modelling. Flows over mountainous or forested regions have been modelled by computational fluid dynamics techniques using in-house developed research computer codes also used by the wind industry.

About Inductiva Research Labs:

Inductiva Research Labs (Inductiva.AI) is a start-up, founded in January 2021, based in Portugal, whose main goal is to democratise access to simulation, on a large scale and in various domains (for example, fluid dynamics, molecular dynamics, structural mechanics, quantum systems, etc). We provide an API to run AI-accelerated simulation and optimization tools that allow scientists and engineers to develop and accelerate efficient solutions in various research areas and industries without wasting time on computational details. By providing easy-to-use, zero-configuration API to the community, we hope to enable the rapid advancement of solutions to some of the most important issues affecting the world.

Our research work is at the intersection of AI and fundamental science. We use AI to supercharge existing simulation and optimization routines. We also implement new simulation scenarios using the latest differentiable programming technologies, so they can be integrated into neural networks and trained and tuned with real data. We are currently researching new methods to accelerate the simulation of molecular dynamics, with applications in the pharmaceutical and biotechnology industry, and fluid dynamics, with applications in the optimal design of solutions for the production of clean energy and resilience to climate change.