PhD position (October 2025 – September 2028)

Impact of climate change on low-level jets in the English Channel and North Sea region: contribution of artificial intelligence

Keywords	Artificial intelligence (AI) and optimization, explainable AI, feature selection, environment and natural resources, coastal zone, meteorological events, Atmospheric dynamics
Project summary	**Explainable AI** aims to make the recommendations of AI systems more transparent and interpretable. **Feature selection**, a key component of this process, involves choosing a subset of relevant features for prediction models while maintaining the original data semantics. This selection can be framed as an **optimization problem**. However, its inherent complexity presents scientific challenges, causing current methods to yield suboptimal solutions and revealing a poorly understood **bias** in existing approaches. This **interdisciplinary** thesis project aims to study and enhance these technologies within the framework of optimization and explainable AI, while assessing their benefits in the **environmental domain**. Feature selection has applications in various fields, particularly in the study of **meteorological phenomena**. We will focus on predicting and analyzing extreme events, as well as examining atmospheric pollution distribution in the context of **regional climate changes**. The development of green energies is part of a broader regional economic development perspective. This project will use **local data** from remote sensing, **global data** from reanalyses (ECMWF), and data from various climate **models**.
Qualifications	The candidate should have a Master's degree or an Engineering school diploma in Informatics and/or a Master's degree in climate sciences or meteorology, or a Master's degree in physics. Candidates should have solid expertise in algorithms, combinatorial optimization, machine learning and data science. In-depth knowledge of atmospheric physics and environmental sciences is a major asset. Programming skills (Python) are also essential, as is a good level of English.
Application	Candidates are invited to send their application by email on **May 6th 2025** by the latest. The application should include a CV, the transcript of grades for the diploma, a description of past research and engineering activities during training periods, a cover letter and names and contact details of two referees (teachers, training tutors) that could be contacted. The scholarship will be granted after validation of the candidate's record by the university post-graduate school (which will also interview the candidate) and by the funding organism.
Salary	**~1800 €** net monthly salary before tax. Casual teaching is possible if the level of French is sufficient.
Dates	From October 1st 2025 to September 30th 2028.
Lab location	OSMOSE team, Laboratoire d'Informatique Signal et Image de la Côte d'Opale (LISIC), Université du Littoral Côte d'Opale (ULCO), 50, rue Ferdinand Buisson, 62228 Calais, France ATMO team, Laboratory of Physics & Chemistry of the Atmosphere (LPCA), ULCO, 189A, avenue Maurice Schumann, 59140 Dunkerque, France
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