Position Offered: POSTDOCTORAL RESEARCHER

Project: *Seagrass meadows: Risk assessment with drones and AI*

Technological and scientific fields: Remote sensing, Image analysis and computer vision, Artificial intelligence, Computational biology and High performance computing, Climate change and biodiversity, Advanced techniques in Earth and ocean observation.

Location: Palma de Mallorca, Baleares, Institute for Cross-Disciplinary Physics and Complex Systems, IFISC (CSIC-UIB), https://ifisc.uib-csic.es

Research Group/PI: Life and Environment, Damià Gomila, https://ifisc.uib-csic.es/en/research/life-and-environment/

PROJECT SUMMARY

Recent advances in geospatial remote sensing and artificial intelligence techniques allow for the automatic detection and monitoring of at-risk seagrass ecosystems in a cost-effective and large-scale manner. Currently, the automatic identification of at-risk seagrass meadows is limited by the low resolution of satellite images and the lack of drone image coverage. The main objective of the project is to map the spatial organisation of seagrass meadows along the coast of Mallorca using unmanned aerial vehicles (UAVs or drones). By means of massive image analysis and the application of pre-existing mathematical models, which serve as a basis for the training of artificial intelligence (AI) algorithms, advanced coastal monitoring methods will be developed to detect at-risk seagrass meadows.

PROFESSIONAL PROFILE

Minimum requirements:

Doctorate in Physics, Proficiency in Spanish and English

Merits to be considered:

Knowledge of mathematical models of growth of clonal plants such as Posidonia. Knowledge of techniques for image analysis. Experience in developing and using numerical codes for the integration of partial differential equations. Drone pilot qualification. Experience in using drones to capture images.

WHAT IS OFFERED

Opportunity to work in an area of ecological relevance, contributing to the protection and monitoring of seagrass meadows. Collaboration with experts in marine biology, mathematical modelling and development of artificial intelligence. Training in: Design and planning of flights according to specific regulations; Application of image processing techniques for the analysis of cartographic data; Management of advanced software and tools for processing high-resolution images; Numerical simulation of vegetation distributions using mathematical growth models; Development and training of machine learning and deep learning algorithms; Generation and use of synthetic images using 3D modelling techniques; Training and validation of artificial intelligence models for the quantification of vegetation density; Use of real and synthetic data to improve the accuracy and robustness of AI models.

Contract conditions:

Indefinite contract for a Postdoctoral Researcher associated to the Momentum Project of 4 years' duration according to Spanish science law. Gross annual salary (41.000 € - 52.000 €).

Start of contract: before 31 December 2024

PRINCIPAL INVESTIGATOR CONTACT

Email: damia@ifisc.uib-csic.es

Phone: +34 971259837

momentum@csic.es | https://momentum.csic.es/

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