Position Offered: POSTDOCTORAL RESEARCHER

Project: *Developing a scalable individual-based ecosystem model to understand human impacts in complex natural systems*

Technological and scientific fields: climate change & biodiversity, digital twins, data analysis & integration, high-performance computing, computational biology, complex systems

Location: Sevilla, Andalucía, Doñana Biological Station, https://www.ebd.csic.es/

Research Group/PI: DEMOCAST, Maria Paniw, https://globalchangeeco.com/

PROJECT SUMMARY

We will use decades of ecological data from Doñana Natural Area, coupled with advanced methods in computational biology, to develop a digital twin. We have three main objectives:

(i) To create a dynamic database structure to obtain abiotic and biotic information from Doñana Natural Area by digitizing and continuously updating, via cloud-based workflows, primary data

(ii) To develop new methods in data integration based on high-output latent state computing which allow to join disparate data types and scales into one modelling framework

(iii) To develop a digital twin that scales up, from individuals to ecosystems, the effects of interacting global-change on terrestrial ecosystems in Doñana Natural Area

The main tasks of the project therefore consist in coordinating cloud-based iterative forecasting; integration of high-quality species counts, camera trap, bio-acoustic and remote-sensing data; and demographic modelling. The postdoc will be integrated in an international, dynamic, and interdisciplinary team at EBD.

PROFESSIONAL PROFILE

Minimum requirements:

- PhD in Biological or Natural Sciences or similar
- Fluent in at least one scientific programming language (R, Python, C++, Pascal)
- Experience in individual demographic modelling and ecological forecasting
- A track record of publishing high-quality research (commensurate to career stage)
- Excellent communication skills (both written and oral) in English
- Ability to work independently and capacity to collaborate in an international environment

Merits to be considered:

- Experience in working with non-academic (policy) stakeholders
- Experience in parallel computing, collaborative coding, and version control (e.g., Git)
- Previous experience with modelling some components of terrestrial systems in Doñana
- Processing and integrating different data types into ecological predictions

WHAT IS OFFERED

Skill development: cloud-based automated data workflows; bio-data processing with machnice learning and AI; latent-state Bayesian modelling; predictive modelling. Collaborations & research stays: Ecological Forecating Initiative (USA, Germany, Finland), Uni Potsdam, BIOCOM-SC (co-PI); Training: 146 ECTS total, including Barcelona Supercomputing Center, bioinformatics courses at Transmitting Science/Coursera: Gordon Conferences on Agent Based Modelling

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: maria.paniw@ebd.csic.es

Phone: +34 671 246 338