

Position Offered: POSTDOCTORAL RESEARCHER

Project: *Genetic Programming for Population Genomics*

Technological and scientific fields: Artificial Intelligence, High Performance Computing, Computational Biology

Location: Barcelona, Catalunya, Institut de Biologia Evolutiva, <https://www.ibe.upf-csic.es>

Research Group/PI: Algorithms for population genomics, Oscar Lao, <https://www.ibe.upf-csic.es/lao>, Evolutionary Population Genomics; Elena Bosch, <https://www.ibe.upf-csic.es/bosch>

PROJECT SUMMARY

This project presents an exciting opportunity to be at the forefront of applying artificial intelligence to understand the evolutionary history of species. Key objectives: i) Developing interpretable statistics using Genetic Programming (GP) to resolve complex population genomics questions; ii) Researching and applying advanced AI techniques to evolutionary biology; iii) Exploring Deep Learning (DL) methods and addressing their interpretability challenges; iv) Leveraging GP inspired by biological evolution to produce human-readable solutions.

PROFESSIONAL PROFILE

Minimum requirements:

- A Ph.D. in Computer Science, Bioinformatics, Evolutionary Biology, or a related field.
- Proficiency in JAVA programming language and others such as Python, R, or C++.
- Experience with machine learning (ML) and DL frameworks (e.g., TensorFlow, PyTorch).
- Familiarity with GP and other evolutionary algorithms.

Merits to be considered:

- Proven track record of research in AI, ML, or computational biology.
- Publications in peer-reviewed journals or conferences showcasing relevant work.
- Familiarity with detecting adaptive selection and analyzing demographic scenarios.
- Experience in developing and maintaining software packages or tools for scientific research. Knowledge of best practices in software development, including version control (e.g., Git) and documentation.

WHAT IS OFFERED

We offer cutting-edge scientific and technological research opportunities while providing a holistic training program designed to enhance both scientific expertise and personal growth. The candidate will engage in pioneering research using DL and GP to address complex population genomics challenges. The candidate will have access to state-of-the-art computational resources and collaborate with leading experts in AI and genomics. The project offers a comprehensive Training Plan (240 ECTS in four years), where the candidate is expected to do a minimum of one stay at the Integrative Genomics Lab led by Dr U Martinez Marigorta, regularly report his/her progress, attend to specialized courses on evolutionary population genomics and digital competence as well as the Interval courses (<https://intervals.prbb.org/>) to enhance skills in critical thinking, time management, teamwork, and communication. The candidate will also participate in international meetings such as those of the SBE, the ESSHE, and the ASHG.

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

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