Post-doctoral offer in computational mathematics

Reference: 24-02-00001

The Landscape Dynamics and Biodiversity program is looking to recruit a **post-doctoral researcher** to contribute to the theoretical and applied research of the working team with skills and knowledge on:
  - Numerical analysis and methods
  - Multi-criteria spatial prioritization
  - Heuristic optimization
  - Mixed integer programming techniques
  - IA algorithms implementation and interpretation

The Forest Science and Technology Centre of Catalonia (CTFC), located in Solsona (Pre-Pyrenees, 120 km from Barcelona), Spain, employs app. 150 staff, produces >100 scientific articles annually and has a turnover of app. 6 Mil. €/year. CTFC's research activity is organised around three programs: Multifunctional Forest Management, Landscape Dynamics and Biodiversity, and Bioeconomy and Governance. Further institutional information is available at: www.ctfc.cat/en.

As part of the **Landscape Dynamics and Biodiversity program**, CTFC undertakes research on the ecology of landscapes and biodiversity in a global change context, innovation in multi-purpose forest planning at different scales targeting multiple ecosystem services, development of cutting-edge decision support systems for forest and agroforest planning, as well as fire ecology and other natural disturbances.

The candidate will be part of the **Precision Forestry (PrecFOR) group** and will be involved in the execution of competitive research and knowledge transfer projects related to designing resilient agroforest landscapes, applying spatial optimization methodologies, simulation models, and software developing. He/she will be involved in ongoing European research projects and in the preparation of national and international calls. This research position at CTFC offers an excellent opportunity to develop a scientific career in applied forest and mathematical research in a stimulating work environment.

TERMS OF THE APPOINTMENT

1. The contract may start on April 2024 (start could be delayed to Juny if necessary).
2. It is a full-time position with a scientific-technical activities contract.
3. Based on CTFC labour categories, annual gross salary will be adjusted to the foreseen role and will be commensurated with the specific profile of the selected candidate (qualifications and experience), ranging between 33.000 – 36.000 €/year.
4. The candidate will be based at CTFC in Solsona (NE Spain), with remote working options according to the institution norms (max. 20 h/week).

5. Working time: 37.5 hours per week.
6. 23+6 days of holidays per year. Good family-work balance conditions.
7. Travelling abroad to collaborate with European or American researchers.

KEY RESPONSABILITIES

Key tasks and responsibilities will include:

1. Application of AI methods (pattern recognition, clustering, k nearest neighbour) to develop a Catalan Forest Map based on national forest inventory and LiDAR data.
2. Use of heuristic and/or exact optimization technics to develop and adapt spatial optimization tools for forest management, fire prevention, and conservation planning problems.
3. Adapt the forest projection system FORMES (https://www.ctfc.cat/en/formes.php) to the spatially continuous forest, soil and climatic data and further incorporate new spatially explicit functionalities such as fire spreading and tree seed dispersal.
4. Develop decision-support systems and integrate forest dynamics and management model simulations.

BASIC REQUIREMENTS

1. A PhD in computer science, bioinformatics and biostatistics, mathematical modelling, industrial engineering, operational research, data science, or related suitable discipline for the main topic of this call.
2. Advanced expertise in numerical methods and spatial, multi-objective optimization methodologies.
3. Expert in programming (R, C, C++, Python, …) and advanced statistical techniques.
4. Demonstrated computer skills in the use of GIS for spatial data management.
5. Familiarity with Machine Learning models and algorithms.
6. Proved knowledge on forest ecosystems, systematic planning, and multi-criteria decision analysis are an asset.
7. Proven fluency in spoken and written English.

DESIRABLE REQUIREMENTS

1. Demonstrated experience in R+D projects and leading capacities.
2. Ability to disseminate scientific results.
3. Pro-activeness in developing new software (R-packages, forest visualization tool, …) to contribute at the standardization and generalization of the research team's workflows.
4. Readiness to work in multi-disciplinary teams.
5. Excellent organizational skills and capacity to deliver tasks in a timely manner to deadlines.
6. Fluency in Spanish and Catalan would be an asset.

SOFT COMPETENCES

1. Good communication skills.
2. Capacity to write technical reports.

3. Result oriented.
4. Flexibility and adaptation.
5. Availability to travel locally and internationally.
6. Initiative and pro activity.

CONTACT

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CTFC guarantees an open, transparent, and merit-based recruitment process (OTM-R) to all registered candidacies avoiding thus any bias on gender, origin, age, ideology, or other circumstances that could be discriminatory.
Integration policy: Candidates who have a recognized disability and accredited equal to or greater than 33% will be prioritized, as long as the disability is compatible with the proper performance of the job.

SELECTION PROCESS AND CRITERIA

The selection process is led by the Human Resources Area of CTFC. This process consists of:

1. **Admission of candidates:** applicants must submit a curriculum vitae and letter of intent addressed to borsa.treball@ctfc.cat, **until March 08th, 2024**, indicating the reference code of the offer.
2. **Pre-selection:** verification of compliance with the minimum requirements of the offer.
3. **Selection (from March 09th to March 31st, 2024):** assessment of the preselected candidates by scoring based on objective criteria and interview.
4. **Final decision:** in case of finding the suitable person, the election will be formally communicated to him/her, and the identification of the chosen person will be published on CTFC job openings section.

Further information: borsa.treball@ctfc.cat