Research scientist on multi criteria optimization for complex trade-offs analysis between food production, ecosystem services and biodiversity under climate change
as part of the CLAND Convergence Institute

At Laboratoire Science for Action and Development / INRA

Context:

The job offer links to two projects: CLAND Institute of Convergence and Horizon 2020 SURE-Farm project.

The CLAND Institute of Convergence project (www.cland.lsce.ipsl.fr) funded by the French national research agency for ten years gathers the efforts of more than 100 researchers in the Paris Saclay area from key institutions in the field of climate change impacts, sustainable agriculture, ecosystem services, environmental impacts and land use socio-economics. The scientific challenge tackled by CLAND is to integrate research in modeling climate change, food and fiber production, biodiversity dynamics, ecosystem functioning and land-use socio-economics, together with data syntheses to understand key feedbacks and assess risks and sustainable options for integrated management of land ecosystems. CLAND spans the full range of disciplines necessary to make breakthroughs in the integrated assessment of the interplay between climate change and land use and management.

SURE-Farm http://surefarmproject.eu/ aims to analyze, assess and improve the resilience and sustainability of farming systems in the EU. For this purpose, SURE-Farm creates a novel and comprehensive resilience-enabling framework, develops a set of advanced risk assessment and management tools and apply a resilience assessment accounting for the provision of food production and ecosystem services.

Job description:

The successful candidate will apply multi criteria analysis for optimizing food production, biodiversity and ecosystem services in a changing climate at global and European scales. He/She will calibrate statistical models linking land use, land cover, and climate variables to food production, ecosystem services, biodiversity, and environmental impacts. He/She will run and exploit outputs from exploratory or target-seeking scenarios. An optimization framework will be developed to explore possible future configurations of the outputs (food, biodiversity, ecosystem services) under climate and land use change (what-if scenarios), or to find optimal land use/land cover configurations to address complex multi-dimensional conflicts (target-seeking scenarios), taking into account different possible climate change scenarios. Optimization will be likely done with evolutionary algorithms. Models and scenarios will be calibrated and run at the large scale, from Europe to global. This work will be based on two data sets (i) a global data set on biodiversity and ecosystem services coordinated by the IPBES expert group on scenarios and models. (ii) a pan European data set produced by different institutions (JRC, INRA, EEA…).

Responsibilities and tasks:

- Collection of the data useful for model calibration
- Choice of the best spatial resolution and data adaptation (upscaling/downscaling)
- Analysis of the relevant literature
- Interactions with collaborators and partners to define the most relevant scenarios to run
- Scenario running

Required education, experience and skills:

Applicants should hold a PhD and have a strong background in multi criteria decision analysis. Furthermore, applicants should have:

     - strong analytical skills to work with large and multiple datasets,

     - a good knowledge of at least one programming language and Linux/Unix,

     - a proven ability to work in a team and network with a range of scientists.

     - experience in running models at the large scale or optimization procedures for addressing complex models

Experience in Python and interfacing with GIS is desirable.

We are open to candidates who are strong in multi-criteria analysis, even if they feel they are less competent in other aspects of the job profile – as they will have good support to help bring them up to speed on areas where they may have less familarity.

Location:

AgroParisTech campus in Paris V. Regular visits to different teams of the CLAND project www.cland.lsce.ipsl.fr for collaboration, seminars and conferences, in particular to ESE lab www.ese.u-psud.fr .

Collaborations:

F. Accatino, M. Tichit & Alberto Tonda (INRA); P. Leadley (Paris-Sud University), B. Gabrielle (AgroParisTech) in CLAND.

Contract duration:

Fixed-term period of 24 months with possibility of an extension.

How to apply:

Applicants should submit a complete application package by email to Francesco Accatino Francesco.accatino@inra.fr and Muriel Tichit Muriel.tichit@inra.fr . It should include (1) a curriculum vitae including most important recent publications, (2) statement of motivation (see above) and (3) names, addresses, phone numbers, and email addresses of at least two references.

The position is available from 01/11/2018 and will remain open until filled with review of applications and interviews. Salary follows national directives including full social and health benefits, and is adjusted for work experience (around 2346 euros net with 4 year experience including full social and health benefits).