Teagasc Post-Doctoral Research Fellow Level 1 Specification

Post Title	**Teagasc Post-Doctoral Research Fellow Level 1 (PD1) – Earth Observation**
HR Reference	PD1/EO/AT/0519
Research Area	Earth Observation
Eligibility	PhD in a relevant discipline with up to 3 years' (max.) relevant experience. The combined total of this contract combined with any other PD1 contracts must not exceed 3 years in total.
Project Title	Automation & Validation of farm scale habitat mapping.
Current Project End Date	20/09/2024
Post Duration	The indicative duration of 24 months, but not exceeding the above project end date, subject to contract A panel may be formed from which future similar vacancies may be filled.
Location	Teagasc Research Centre, Ashtown, Dublin 15.
Reports to	Project Leader and/or other nominated manager as maybe identified from time to time.
Training Rate	Appointment will be at the minimum point of the Post-Doctoral Level 1 (PD1) scale (€35,678). The current PD1 scale is as follows: PD1: €35,678 (min.); €37,757; €39,529 (max.) Increments will be awarded annually* subject to performance and completion of the prescribed training plan. *Note: Exceptional circumstances may apply for candidates with current or previous service in the public sector. *Remuneration and the annual cycle for the payment of increments may be adjusted from time to time in line with Government policy.*
Basic Function of the post:	Using Sentinel 1 and 2 earth observation data to create object based farm scale habitat maps for Ireland that cross validate with photography from untrained observers, and labelled through machine learning of farm habitats (with project partners Insight UCD).

Background:

The Teagasc post-doctoral programme provides training and development opportunities for early career scientists that enhances their experience of learning and equips them with the necessary skills for the next stage of their chosen career in research.

The inclusion of data on habitat features is becoming an urgent requirement of farm-scale sustainability and certification schemes, e.g. Sustainability Assessment Initiative (SAI) Platform, a global food and drink industry initiative for sustainable agriculture.

Mapping farmland habitats and assessing a farm's nature value is a complex task, typically carried out by expert surveyors on the ground. The logistics and expertise required makes it a very expensive exercise. However, the task can be simplified and automated using remote sensing, machine learning and ground validation.

This project (part of the VistaMilk SFI Centre funded by SFI and DAFM) will conduct object-based classification (Random Forest models have proved the most robust method in Irish landcover mapping) of farmland habitats using Copernicus Sentinel data, with farm objects pre- constrained by OSI Prime 2 field boundaries to improve image integrity. This will be for three or four sub-county trial areas determined by dominant farm system.

The output of this task will be a nationally representative set of farm scale objects (fields in most cases) classified for the habitats they contain. The project will explore machine learning in land cover classification of farm objects through EO and methods to automatically locate ground level image targets in terrestrial photography of the objects. The researcher will work in the remote sensing group in Teagasc Ashtown, Dublin and liaise fully with project partners in Insight UCD. The Insight team will be using machine learning to extract relevant habitat data from farmer supplied imagery which in turn will validate outputs from the remote sensing.

This is a research focused training role, the primary purpose of which is to provide early career scientists with the opportunity to develop their research skills and competencies.

The PD Fellow will, while working in conjunction with senior research staff, gain insight and experience into a variety of areas including the processes of project and budgetary management, publishing in peer-reviewed academic journals, writing grant applications, and attracting external funding; the development of active collaboration with relevant national and international research communities; the development of communication and presentation skills, leadership and management skills, and overall career development.

Modules will be conducted under the supervision and direction of the (Project Leader) or other designated manager in conjunction with the Head of Department.

Duties & Responsibilities <u>specific to this project</u>:

- Conduct remote sensing research.
- Manage relevant data (remote sensing and ground data) to the appropriate standards.
- Conduct field visits to collect relevant habitat ground truth data in Ireland.
- Commit to SFI/VistaMilk data standards on data sets and code produced within the project.

Additional Duties & Responsibilities:

- Interpret research findings and prepare scientific and popular press publications.
- Disseminate research findings to a variety of audiences as appropriate.
- Assist Teagasc in meeting the commitments of the Quality Customer Service Charter and action plan.
- Comply with all relevant Teagasc policies and procedures.
- Fully co-operate with the provisions made for ensuring the health, safety and welfare of themselves, fellow staff and non-Teagasc staff and co-operate with management in enabling Teagasc to comply with legal obligations. This includes full compliance with the responsibilities outlined in the Safety Statement.
- Actively participate in the Teagasc Post Doctoral Fellowship programme and review processes, and to undertake all Post Doctoral fellowship training and associated duties as agreed in the Training & Development Plan.
- Take up additional duties as they may arise and be assigned by management.

Person Specification

This section outlines the qualifications, skills, knowledge and/or experience that the successful candidate would be required to demonstrate for successful discharge of the responsibilities of the post. Applications will be assessed on how well candidates satisfy these criteria.

Essential

- PhD in Remote sensing (land).
- Relevant research experience not to exceed 3 years' post-PhD.
- Demonstrated research and technical expertise in remote sensing classification, EO machine learning approaches and coding.
- Evidence of research activity (publications, conference presentations, awards) and future scholarly output (working papers, research proposals etc.).
- Evidence of strong mathematical skillset.
- Clean Driving licence.
- Experience in field work in a rural setting.
- Excellent project management, analytical, report writing and data analysis skills.
- An ability to collaborate with team members and PhD students to help build research knowledge and skill and to guide professional development.
- Excellent communication skills (oral, written, presentation) with an ability to enable effective knowledge and technology transfer.
- Ability to generate new ideas, unique concepts, models and solutions.

Desirable

- Experience in Habitat or Agriculture mapping.
- Experience in setting own research agenda.
- Evidence of teamwork and collaboration with relevant partners.

Further Information for Candidates

Candidates can access a Fellowship Programme Application form for this post on the Teagasc website at https://www.teagasc.ie/about/opportunities/post-doctoral-opportunities/ Teagasc do not accept Curriculum Vitaes as an application for a position. In order to apply for a post the relevant application form must be completed in order to be considered.

Completed application forms should be TYPED, saved in PDF format and submitted by email to teagascjobs@clark.ie no later than **12 noon on Monday 24th June 2019.** Applications received after this time will not be considered.

Teagasc is an equal opportunities employer. As part of Teagasc Gender and Diversity strategies, Teagasc welcomes a balanced pool of applicants. Canvassing will disqualify.

The details contained above are subject to change without notice.