

JOB DESCRIPTION

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| Vacancy reference: | SRF31873 |
| Post Title: | Data assimilation scientific programmer (PDRA) |
| Grade: | Grade 6 |
| School/Department: | Department of Meteorology |
| Reports to: | Prof Alberto Carrassi |
| Responsible for: | None |

Purpose

We are seeking for an enthusiastic, self-motivated and independent Data Assimilation Scientific Programmer to maintain and develop the data assimilation software systems of the National Centre for Earth Observation (NCEO) and support users of these systems in NCEO and the wider UK academic community. The post holder will contribute on cutting-edge research on timely urgent environmental and climate issues, as part of a worldwide leader research centre on the field.

Data assimilation is the science of combining observations of an environmental system with numerical models in a statistically and dynamically sound way. It is used throughout NCEO in a wide range of environmental systems, incorporating satellite observations into models of the climate, atmospheric chemistry, ocean, land surface and carbon cycle. This allows us to understand much more about the Earth system than we could from observations, or computational models, alone. A fundamental role of the NCEO group at University of Reading is to provide state-of-the-art data assimilation systems to scientists throughout NCEO with a variety of data assimilation methods and to advise on adapting these methods to different application areas, as well as to develop new techniques and provide data assimilation software.

The group has developed its own data assimilation software framework and is currently undergoing a transition to other existing systems, the Fortran-coded Parallel Data Assimilation Framework (PDAF) for high-dimensional systems and Python-coded Data Assimilation Package in Python for Experimental Research (DAPPER), for theoretical-oriented methodological studies with low-dimensional models.

Main duties and responsibilities

Research:

- develop and maintain data assimilation software suitable for the needs of NCEO scientist
- provide assistance on the use of this software to the NCEO and wider UK academic community
- produce online documentation
- adding further data assimilation methods to the current software suite
- interfacing more models with the software to allow new application areas to be investigated
- supporting current and future users of the systems and identifying their future requirements
- providing support for smaller, tailored data assimilation systems linked to specific applications

- collaborate with scientists within NCAO and throughout the UK Earth Observation and modelling communities by facilitating and consulting on the combination between data and model
- interact with the main developers and the wide users' community of PDAF and DAPPER
- collaborate with colleagues within the University in the development of original research
- provide specialist advice to other staff and students within the University
- disseminate research findings and establish a national reputation through participation in national conferences, exhibitions etc.
- contribute to the development of research proposals and projects

Enterprise & Outreach:

- carry out consulting or specialist activities under the supervision of a project leader.
- possibilities to liaise with industry partners and clients external to the University and NCEO
- attend relevant seminars, conferences, exhibitions and other events
- contribute to writing and presenting client reports

Supervision received

The post will be supervised by Prof Alberto Carrassi, the NCEO director of data assimilation. The supervision will include general guidance as well as detailed monitoring on key technical choices.

Supervision given

N/A

Contact

The post will be a core post in the NCEO. NCEO is a Natural Environment Research Council (NERC) research centre providing national capability in Earth Observation science. It is a distributed centre of over 100 scientists in the UK, led by Prof John Remedios at the University of Leicester. The post-holder will liaise with other data assimilation scientists in Reading and with users of data assimilation throughout the NCEO in order to contribute to this.

Terms and conditions

The post is full time (35 hours per week). The post is initially up to 4 years with the possibility of further renewal. Applications for part-time working will be considered in line with business needs.

This document outlines the duties required for the time being of the post to indicate the level of responsibility. It is not a comprehensive or exhaustive list and the line manager may vary duties from time to time which do not change the general character of the job or the level of responsibility entailed.

Date assessed:

PERSON SPECIFICATION

| Job Title | School/Department |
|--|---------------------------|
| Data assimilation scientific programmer (PDRA) | Department of Meteorology |

| Criteria | Essential | Desirable |
|----------------------------|--|--|
| Skills Required | <ul style="list-style-type: none"> • Fortran90/ C • MPI • One of Python, Matlab, R or similar, with a preference for Python. • Good written and oral communication skills | |
| Attainment | <ul style="list-style-type: none"> • PhD or equivalent in a quantitative science or mathematics (or expectation to gain a PhD shortly) | <ul style="list-style-type: none"> • PhD on data assimilation |
| Knowledge | <ul style="list-style-type: none"> • Basic statistical techniques • Scientific computing | <ul style="list-style-type: none"> • Data assimilation. • Environmental science or modelling. • Optimization techniques/ inverse modelling. • HPC platforms, specifically distributed and shared memory architectures. |
| Relevant Experience | <ul style="list-style-type: none"> • Compiling and running large and complex numerical models. | <ul style="list-style-type: none"> • Running large data assimilation codes. • Developing efficient numerical tools for complex high-dimensional data structures. |
| Disposition | <ul style="list-style-type: none"> • Ability to work in a team. • Ability to effectively support other scientists. • Self-motivated. • Enthusiasm toward environmental science issues and to undertake new challenges and directions | |
| Other | | |

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| Completed by: Alberto Carrassi | Date: 10/02/2020 |
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