Job Description

Research Associate

Salary: Grade 7
Contract: or a fixed term period of 33 months
School/Department: School of Computing
Location: Canterbury
Responsible to: Dr Dominic Orchard

Job purpose

Climate change is one of the greatest challenges of our time. Assessing its risks and our progress towards mitigating its worst effects requires processing a wealth of data and computing simulations to make decisions that affect the lives of billions worldwide, both now and in the future. However, in the last decade, climate modelling has faced diminishing returns from current hardware trends and software engineering techniques. Developing the required models and analysis tools to effectively process, explore, and derive policy decisions, with a high degree of transparency and trust, remains difficult. There is therefore a need for computer scientists to develop programming tools, languages, and systems to enable scientists to more effectively develop the next generation of climate modelling and analysis tools.

This post, embedded in the Programming Language and Systems group at Kent, will undertake novel research on programming languages, tools, and systems to support climate modelling and climate scientists. This work could be from several perspectives, for example, but not limited to, static analysis tooling for numerical models, verification of critical libraries used by climate scientists, developing novel language ideas for future computational science efforts, extending existing languages with novel features to support science, or developing new tools (including libraries) to support climate science research. Projects that are driven from a climate science perspective, including data-driven techniques for climate science, are also welcome.

The work will be in collaboration with researchers as the Institute of Computing for Climate Science at the University of Cambridge and under the supervision of Dr Dominic Orchard. There is opportunity to work directly with leading climate scientists, to discover problems that need tackling and to test out novel ideas.

Key accountabilities

- Develop new research ideas around programming language tools for climate science.

Key duties

The following are the main duties for the job. Other duties, commensurate with the grading of the job, may also be assigned from time to time.

- Execute research projects, likely involving implementation work to enable the idea to be tested in the real world for its potential for impact;
- Writing up results for publication and giving talks to disseminate results and ideas;
- Working across disciplines to test out the outcomes of this research in the wild.

Internal & external relationships

Internal: Dr Dominic Orchard, his PhD students and other RAs, and members of the PLAS (Programming Languages and Systems) group at Kent.

External: The Institute of Computing for Climate Science at the University of Cambridge, including Dr Roly Perera (Early Career Advanced Fellow at ICCS).

Any relevant climate modelling groups (internationally) with whom ICCS already works.

Health, safety & wellbeing considerations

This job involves undertaking duties which include the following health, safety and wellbeing considerations:

- Regular use of Screen Display Equipment

Person specification

The person specification details the necessary skills, qualifications, experience or other attributes needed to carry out the job. Applications will be measured against the criteria published below.

Selection panels will be looking for clear evidence and examples in an application, or cover letter (where applicable), which back-up any assertions made in relation to each criterion.

Essential Criteria:

- PhD (or nearing completion of) in Computer Science, Mathematics, or similar subject (A)
- Experience in developing and executing research projects (A,I)
- Deep knowledge and experience in at least one of programming languages design, semantics, static analysis, verification, or climate science (A,I)
- Experience of writing papers (A,I)
- Experience of giving research talks and disseminating work (A,I)
- Ability to critically assess research ideas (I)
- Good programming skills (A,I,T)
- Excellent written communication skills (A,I)
- Excellent oral communication skills (A,I,T)
- Committed to leveraging PL research to support climate research (A,I)
- Firm commitment to achieving the University's vision and values, with a passion for a transformative student experience and multidisciplinary, impactful research (I)
- Commitment to deliver and promote equality, diversity and inclusivity in the day to day work of the role (I)

Desirable Criteria:

- Experience working across disciplines (A,I)
- Ability to plan research projects (I)
- Strong grasp of mathematics (A,I)
- Able to work with different stakeholders across time zones (A,I)

Assessment stage: A - Application; I - Interview; T - Test/presentation at interview stage