NERC innovation Placements Call 2017

Office for Nuclear Regulation - Development of Multivariate Hazard Curves

The Office for Nuclear Regulation (ONR) invites researchers to apply for placements of up to twelve months to investigate statistical methods for the production of multi-variate hazard curves in support of the development of regulatory advice to nuclear inspectors.

ONR has responsibility for regulating safety and security at nuclear licensed sites in the UK and uses research to support its independent regulatory decision making. The main objective of ONR's research strategy is to ensure that ONR's inspectors will form their regulatory judgements confidently and effectively using sound, up to date scientific and technical information.

In order to demonstrate safety at nuclear sites, nuclear operators have to consider meteorological hazards affecting their facilities. This is traditionally done for each hazard individually (example extreme rainfall) using extreme value statistics to generate univariate hazard curves which characterise the severity of the hazard against its probability of exceedance. Modern regulatory guidance however calls for credible combinations of hazards to be considered. The objective of this research is to investigate the practicability of developing multivariate hazards curves to characterise hazard combinations that might be expected during extreme weather conditions such as winter or summer storms. The work will build on initial studies carried out for ONR by Lancaster University[1].

The successful applicant is likely to be involved in a range of activities, including:

- Obtaining real, or generating synthetic meteorological data
- Resolving technical issues identified during initial studies at Lancaster University
- Identifying further development work
- Liaising with ONR inspectors
- Producing example hazard curves, univariate and multivariate by the application and development of extreme value theory
- Uncertainty analysis
- Sensitivity analysis
- Presentation of work to ONR inspectors at ONR offices (Bootle)

Whilst the above activities are expected, development of a detailed specification will be carried out with liaison between the successful candidate and ONR. It is expected that the successful applicant will be based at their academic establishment, with close liaison with ONR inspectors as necessary including at the ONR offices in Bootle, as necessary.

[1] ONR Internship: Introduction to Extreme Value Theory and Constructing Hazard Curves
Emma Simpson, Lancaster University

The output from the work will be a written report suitable for publication on the ONR website, a presentation to ONR, and a case study satisfying the NERC Innovation Placement deliverable requirement.

Application process:

Applicants interested in undertaking a placement with ONR, and who satisfy the NERC Innovation Placement eligibility requirements, should register their interest by contacting ONR.Research@onr.gov.uk by Friday 26th May 2017. Applicants will ideally have experience of univariate and multivariate extreme value methods. The chosen applicant will then need to develop a full funding application with liaison with ONR to be submitted to NERC by 29 June 2017.

A Letter of Support is required from The Office for Nuclear Regulation.

Contact:

For queries about this call, please contact:

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For technical queries regarding the content of the Placement at ONR please contact: ONR.Research@onr.gov.uk