UNIVERSITY of GREENWICH

Information on Postgraduate Research Scholarship - Ref: VCS-FES-07-22			
Faculty:	Engineering and Science	**School:**	Computing & Mathematical Sciences
Lead Supervisor:	Dr Nadarajah Ramesh		
Project Title:	Doubly Stochastic and Hidden Markov Models with Environmental Applications		
Project Description:	This project plans to develop stochastic models based on doubly stochastic and hidden Markov processes to model environmental time series. One of the aims of the project is to expand the available stationary models to a non-stationary domain, incorporating time-varying covariates in the modelling, to make more accurate inferences and gain greater understanding of the environmental data and the behaviours of their extremes. In this context, the project aims to take the recent work on stochastic modelling further to develop models based on Cox processes and hidden Markov models and explore their applications in the analysis of environmental and hydrological data. Another aspect of the project is to develop a bivariate modelling framework using copula approach to incorporate inter-dependence among environmental time series. This will provide more realistic models that can capture the properties of multivariate data and their extremes. Stochastic point process models provide a basis for generating synthetic rainfall input to hydrological models where the observed data at the required temporal scale are not available. The design of flood mitigation measures requires the availability of simulated rainfall and related hydrological variables for the future, which makes the proposed research very exciting and relevant. The main objective is to advance the stochastic modelling framework in this area of hydrological modelling, by introducing non-stationarity, which will impact positively on future environmental planning, modelling and predictions. The other research objective of the project is to develop a class of models that can generate multivariate time series, providing inputs to urban drainage models and small rural catchment hydrological models which are required for the understanding of how flows in such catchments are generated. This joint project provides the student with an opportunity to collaborate with colleagues from the Department of Civil and Environmental Engineering at Imperial College London, an expert group in stochastic environmental systems. Project will involve extensive computation using RStudio and/or Python. A potential candidate is expected to have a strong Probability and Statistics background with good ability in performing analytical and methodological research.		
Duration:	3 years, Full-Time Study or		

	6 years, Part-Time Study

Bursary available (subject to satisfactory performance):

Year 1: £17,668 plus London weighting where applicable (FT) or pro-rata (PT) Year 2: In line with UKRI rate Year 3: In line with UKRI rate.

In addition, the successful candidate will receive a contribution to tuition fees equivalent to the university's Home rate, currently £4,596 (FT) or pro-rata (PT), for the duration of their scholarship. International applicants will need to pay the remainder tuition fee for the duration of their scholarship.

This fee is subject to an annual increase.

Person Specification of Essential (E) or Desirable (D) requirements:

Criteria:	**E or D**
Education and Training:	
• 1st Class or 2nd class, First Division (Upper Second Class) honours degree or a taught master's degree with a minimum average of 60% in all areas of assessment (UK or UK equivalent) in a relevant area to the proposed research project	**E**
• For those whose first language is not English and/or if from a country where English is not the majority spoken language (as recognised by the UKBA), a language proficiency score of at least IELTS 6.5 (in all elements of the test) or an equivalent UK VISA and Immigration secure English Language Test is required, if your programme falls within the faculty of Engineering and Science a language proficiency score of at least IELTS 6.5 overall with a minimum of 6.0 in all elements of the test or an equivalent UK VISA and Immigration secure English Language Test is required. Unless the degree above was taught in English **and** obtained in a majority English speaking country, e.g. UK, USA, Australia, New Zealand, etc, as recognised by the UKBA.	**E**
Experience & Skills:	
• Previous experience of undertaking research (e.g. undergraduate or taught master's dissertation)	**E**
• Familiarity with both quantitative and qualitative research methods: Mathematics, Probability & Statistics, Computational statistics	**E**
• Experience of programming and relevant software to support research: R/RStudio or Python or Matlab	**E**
• Experience of handling large scale data sets	**D**
• Strong substantive knowledge related to the project (knowledge of Stochastic processes and Markov chain, Rainfall modelling)	**D**
Personal Attributes:	
• Understands the fundamental differences between a taught degree and a research degree in terms of approach and personal discipline/motivation	**E**
• Able to, under guidance, complete independent work successfully	**E**
Other Requirements:	
• This scholarship may require Academic Technology Approval Scheme approval for the successful candidate if from outside of the EU/EEA	**E**
• The scholarship must commence by August **2023**	**E**

Closing date for applications:	**midnight UTC on 16/06/2023**
For further information contact:	**Dr Nadarajah Ramesh** **E-mail: N.I.Ramesh@greenwich.ac.uk**

Making an application:

Please read this information before making an application. Information on the application process is available at: https://www.gre.ac.uk/research/study/apply/application-process. Applications need to be made online via this link. **No other form of application will be considered**.

All applications **must include** the following information. **Applications not containing these documents will not be considered.**

- **Scholarship Reference Number (Ref)**– included in the personal statement section together with your personal statement as to why you are applying
- **a CV including 2 referees** *
- **academic qualification certificates/transcripts and IELTs/English Language certificate if you are an international applicant or if English is not your first language or you are from a country where English is not the majority spoken language as defined by the UK Border Agency** *
- In the first part of the application select the following: **PhD Mathematical Sciences (MPhil/PhD)**

**upload to the qualification section of the application form. Attachments must be a PDF format.*

Before submitting your application, you are encouraged to liaise with the Lead Supervisor on the details above.