Title: Climate change adaptation for urban and interdependent critical infrastructure systems

Type of award: PhD Research Studentship

Department: Civil Engineering

Scholarship Details: Minimum £17,668 p.a. in 2022/23 subject to confirmation of eligibility and award

Duration: 4 years

Eligibility: Home / EU / Overseas students

Start Date: 18 Sept 2023

PhD Topic Background/Description

Climate change and decarbonization are posing unprecedented challenges to critical infrastructure systems, such as power and transportation systems. Notably, climate change is expected to increase the frequency and intensity of extreme weather events (such as heat waves and flooding) associated with major disruptions to critical infrastructure systems. Critical infrastructure systems are vital for the well-functioning of economies and societies worldwide and should be designed and operated at satisfactory quality levels even under adverse weather conditions. On the contrary, currently they are typically at higher risk of collapsing due to physical damage and/or operation out of acceptable limits when extreme events happen. Moreover, disruptions to a given infrastructure system may have direct and indirect impacts on other infrastructure systems and lead to cascading failures. Thereby, a holistic approach is required to improve resilience of critical infrastructure systems to extreme weather events and promote climate change adaptation.

The proposed project is aimed at investigating and developing new methodologies for climate change adaptation in urban environments, considering flooding and heat waves impact to infrastructure systems. Topics of interest include but are not limited to cascading impacts of disruptions to power and transportation infrastructure; risk assessment in terms of impact to the built environment (disruption to service, monetary loss); climate projections and associated impact to urban infrastructure; scenario planning of urban adaptation; urban resilience of tomorrow cities. The theoretical efforts are complemented by simulations and experimental validation in realistic scenarios, in which the baseline and adaptation scenarios will be evaluated comparatively.

This project supports and builds on the University’s disciplinary and interdisciplinary excellence in tackling global challenges relating to climate, energy, and infrastructure systems. It will be carried across the Department of Electrical and Electronic Engineering, Department of Civil Engineering, and School of Geographical Sciences. Supervisory support from across all three departments will ensure high quality and interdisciplinarity of the PhD outputs, as well as applicability to national resilience challenges. As an outcome, the successful candidate will also have the opportunity to interact and collaborate with existing networks of
the supervisory team and the wider research community. This project is one of the two vacancies available at the University of Bristol on the broader topic “Climate change adaptation and infrastructure”.

**Candidate Requirements**
Applicants must hold/achieve a minimum of a master’s degree (or international equivalent) in an engineering, science, computing or mathematics discipline. Applicants without a master's qualification may be considered on an exceptional basis, provided they hold a first-class undergraduate degree.

If English is not your first language, you need to meet this profile level: **Profile E**
Further information about [English language requirements and profile levels](#).

**Skills and knowledge required**
Applicants should have excellent analytical skills, a strong background in numerical methods and computing, and experience with programming languages such as Python and MATLAB.

A background understanding in one or more of the following: environmental science (e.g. climate change, urban adaptation), hydrology, geo-engineering would be desirable.

**Scholarship Details**
The PhD Studentship for this research will receive a minimum stipend equivalent to the UKRI tax-free stipend of £17,668 per annum (22/23). The funding will also cover tuition fees for the length of the programme at both Home and Overseas student rates.

Funding is subject to eligibility status and confirmation of award.

For eligibility and residence requirements please check the [UKRI UK Research and Innovation](#) website.

**Enquiries**
For questions about eligibility and the application process please contact [came-pgr-admissions@bristol.ac.uk](mailto:came-pgr-admissions@bristol.ac.uk)

Informal enquiries, please contact Dr Laiz Souto at [laiz.souto@bristol.ac.uk](mailto:laiz.souto@bristol.ac.uk) Dr. Jeffrey Neal at [J.Neal@bristol.ac.uk](mailto:J.Neal@bristol.ac.uk), Dr Raffaele De Risi at [Raffaele.derisi@bristol.ac.uk](mailto:Raffaele.derisi@bristol.ac.uk) and Prof. Paul Bates at [Paul.Bates@bristol.ac.uk](mailto:Paul.Bates@bristol.ac.uk).

**Application Details**
Applicants are encouraged to contact the supervision team (noted above) prior to application.

To apply for this studentship, submit a PhD application using our [online application system](#) [www.bristol.ac.uk/pg-howtoapply]

Please ensure that in the Funding section you tick “I would like to be considered for a funding award from the Civil Engineering Department” and specify the title of the scholarship in the “other” box below with the names of the supervisors.

Interested candidates should apply as soon as possible. Applications will remain open until the position is filled.