Information on Postgraduate Research Scholarship
Ref: FS-ES-04-2027-4

Faculty:	Engineering and Science	**School:**	Engineering
Lead Supervisor:	Dr. Dimitrios Loverdos		
Project Title:	Linking Concrete Production Data with Structural Monitoring for Service-Life Assessment		
Project Description:	Concrete generates valuable information throughout its life. During production, data are collected on its composition, batching, fresh properties, and strength. Later, information on its actual condition can be obtained through testing, inspection, and structural health monitoring. However, these stages are often treated separately, meaning that information available when concrete is produced may not be fully used when the structure is assessed later in life. Recent research shows the potential value of connecting these stages. (White et al., 2025) demonstrated how concrete material, production, and performance data can be linked through digital traceability. (Akiyama et al., 2025) review how inspection, monitoring and probabilistic methods can support remaining-service-life assessment of deteriorating reinforced-concrete structures, particularly those affected by corrosion. (Li et al., 2023) also highlight the importance of durability and service-life extension in reducing the environmental impact of concrete structures. This aligns with UN Sustainable Development Goal targets 9.4, 12.2, and 12.5 on sustainable infrastructure, efficient resource use, and waste reduction (United Nations, 2015). The aim of this project is to investigate whether combining concrete production information with measurements of its behaviour over time can improve deterioration, remaining-service-life assessment, and intervention decisions. The research will have three main stages: First, representative concrete will be characterised using traceable production records and selected laboratory tests. Data include: mix proportions, water/binder ratio, aggregate grading and moisture, admixture dosage, fresh properties, strength, etc. Statistical and machine-learning methods will be used to establish initial performance predictions and identify the production factors most relevant to later behaviour. Where practicable, fresh concrete from industrial production will be used to cast additional specimens, linking production history directly with measured performance. Second, selected specimens will be monitored as their condition changes under controlled or accelerated exposure conditions. One representative damage or deterioration mechanism will be selected (e.g., cracking or chloride ingress), to support a focused experimental programme, with measurable condition changes. Embedded sensors, periodic testing, and inspection will track relevant changes over time, while digital imaging and computer-vision methods may be used to quantify visible defects. Environmental and curing conditions will also be recorded.		

	Third, production information and measurements collected over time will be combined to update deterioration and remaining-service-life predictions. Conventional assessments will be compared with assessments progressively enhanced by production records, monitoring and inspection data. This will quantify the additional value of each information source by showing how much production, monitoring, and inspection data improve prediction accuracy, reduce uncertainty, and influence decisions such as continued monitoring, repair, strengthening, or replacement. The main contribution will be a validated decision-support approach that connects the manufacturing history of concrete with evidence of its actual behaviour over time. Artificial intelligence, statistical methods, sensors, and computer-vision will be supporting tools. The project will support more reliable assessment, targeted intervention, longer safe service life, and reduced whole-life material use and carbon emissions. **This scholarship is awarded competitively, and all applications are carefully reviewed. While we cannot guarantee an offer, we encourage strong candidates to apply.**
Duration:	3 years, full-time study 6 years, part-time study

Support available (subject to satisfactory performance):

For Home students

- A full tuition fee waiver at the Home student rate for the duration of the scholarship.

For International students

- 50% tuition fee waiver against the International student rate for the duration of the scholarship.

Important information

- Tuition fees are subject to annual review and may increase during the course of study.
- This scholarship covers tuition fees only and does not include funding for living, accommodation, or maintenance costs.

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	**E**

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.	
Experience & Skills:	
• Previous experience of undertaking research (e.g. undergraduate or taught master's dissertation)	**E**
• Knowledge in concrete materials, technology, and/or mix design	**D**
• Knowledge in data analysis, statistics, and/or machine learning	**D**
• Experience with laboratory testing, instrumentation, and/or monitoring sensors	**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 before 5th April 2027	**E**

Closing date for applications:	**Midnight UTC on 30th November 2026**
For further information contact:	**Dr. Dimitrios Loverdos**

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 (FS-ES-04-2027-4)**– 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, 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** *

**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.