*School of Computing, Engineering, and the Built Environment*
**Edinburgh Napier University**

# PHD STUDENT PROJECT

**Application instructions:**
Detailed instructions are available at :
https://www.napier.ac.uk/research-and-innovation/doctoral-college/how-to-apply

*Prospective candidates are encouraged to contact the Director of Studies (see details below) to discuss the project and their suitability for it.*

# Project details

**Supervisory Team:**
- DIRECTOR OF STUDY: Dr Masoud Sajjadian (Email: m.sajjadian@napier.ac.uk)
- 2ND SUPERVISOR: Dr Inji Kenawy

**Subject Group:** Built Environment

**Research Areas:** Architecture/Architecture - Building & Planning

**Project Title:** A Framework to Use Parallel Computing and Simulations for Low Carbon Design and Refurbishment

**Project description:**
The new UK net-zero emissions laws create a significant challenge for the built environment professionals to significantly reduce emissions to zero level by 2050. Currently, emissions in the construction industry mostly rely upon a 'fabric first' approach in addition to the use of renewables. However, decision-making at various levels is complicated and embodied carbon of materials adds complexity to the decision-making processes. This PhD studentship aims to develop a customised framework to use parallel computing and simulations to minimise carbon emissions in the design and refurbishment of buildings. The framework covers a broad spectrum from architectural detailing to overall design and material selection for the net zero targets. This investigation also aims to demonstrate how data-driven approaches in digital environments can simplify the decision-making process and support the AEC industry to achieve net zero by 2050.

# Candidate characteristics

**Education:**
2:1 minimum degree in Architecture or Architecture Technology

**Subject knowledge:**
Building physics

**Essential attributes:**
- Excellent understanding of applied building physics
- Competent in building simulations or willingness to learn
- Excellent communication skills