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

MRes 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 Temidayo Osunsanmi (Email t.osunsanmi@napier.ac.uk)
- 2ND SUPERVISOR: Dr Cletus Moobela

Subject Group: Built Environment

Funding status: Self funded

Project Title: Investigating the role of Machine Learning algorithms in the valuation of real estate tokenised assets

Project description:

The real estate industry has witnessed a significant shift towards tokenized assets and fractional ownership, enabled by blockchain technology and digital platforms. This shift was driven by the desire to overcome the drawbacks and shortcomings associated with traditional real estate investment. Traditional investments in real estate are confronted with numerous shortcomings ranging from huge capital outlay, transaction cost, illiquidity and many others. Towards overcoming the real estate investment has metamorphosed into tokenization. This metamorphosis has created new opportunities for investors and property owners. Regardless of the opportunities and advantages provided by real estate tokenisation, it also poses challenges. The valuation of fractionalised real estate assets has been the major challenge emanating from real estate tokenisation. The review of past literatures and practice discovered that it has become difficult to create the standardisation and reveal the value of the

fractionalised asset. This is attributed to the traditional property valuation method adopted by real estate professionals.
Traditional property valuation methods, such as the income approach, sales comparison approach, and cost approach, are not well-suited for tokenized assets. These methods rely on simplistic assumptions, such as uniform ownership and single-asset transactions, which do not reflect the complexity of tokenized assets and fractional ownership. However, machine learning algorithms have shown promise in improving property valuation accuracy by analysing large datasets and identifying complex patterns. However, the current research on machine learning in property valuation focuses primarily on traditional property ownership and does not address the unique challenges of tokenized assets. The unique characteristics of tokenized assets and fractional ownership, such as fractional ownership shares and tokenized income streams, are not adequately considered in current valuation methods. Also, the complex data structures and relationships in tokenized assets and fractional ownership are not fully leveraged in current valuation methods, leading to incomplete and inaccurate valuations. This research aims to bridge this gap by investigating the role of machine learning algorithms in property valuation for tokenized assets and fractional ownership, developing a machine learning-based property valuation framework that addresses the unique challenges of these emerging ownership structures.

Objectives

The objective of the project includes the following:

- To investigate the role of machine learning in the valuation of real estate tokenised assets
- To appraise the challenges for the valuation of real estate tokenised assets.
- To assess the perception of real estate professionals for the suitable machine learning algorithm for valuing real estate tokenised assets.
- To develop a machine learning algorithm for the valuation of real estate tokenised assets

Candidate characteristics

Education:

A first degree (at least a 2.1) ideally in Real estate surveying, computer science and other related discipline.

English language requirement

IELTS score must be at least 6.5 (with not less than 6.0 in each of the four components). Other, equivalent qualifications will be accepted. Full details of the University's policy are available online.

Essential Attributes:

- Good written and oral communication skills in English
- Competent in the use of statistical software
- Knowledge of AMOS, SmartPLS software
- Basic understanding of Python programming
- Evidence of independent research skills relevant to the project

Desirable attributes:

- Time management and curiosity to learn something new

Application checklist:

- Statement no longer than 1 page describing your motivations and fit with the project
- Recent and complete curriculum vitae. The curriculum must include a declaration regarding the English language qualifications of the candidate.
- Supporting documents will have to be submitted by successful candidates.
- 2 academic references, using the Postgraduate Educational Reference Form (download)