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

PHD STUDENT PROJECT

Funding and application details

Funding status: Self-funded students only

Application instructions:
Detailed instructions are available at https://www.napier.ac.uk/research-and-innovation/research-degrees/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: Professor Mark Deakin (Email: M.Deakin@napier.ac.uk)
- 2ND SUPERVISOR: Dr Suha Jaradat

Subject Group: Built environment

Research Areas: Built Environment and Urban Planning

Project Title: Smart Cities 4.0

Project description:

The intelligence of smart cities has been the subject of much academic debate over the past 20 years. This PhD opportunity shall study the latest version of smart cities as the urban and regional innovation system of the fourth industrial revolution. Smart Cities 4.0 shall study the extent to which the connected intelligence model of smart city systems develop a platform of applications for urban and regional innovation that optimize energy consumption as locally produced renewables sustaining the development of homes and neighborhoods.

Studying this ex-tensification of the connected intelligence model as the higher-order logic of S4 (the Smart Specialization Strategies of Sustainable

Development), the PhD shall focus on the metrics of Smart Cities 4.0 and the methodological challenges which the measurement of this urban and regional innovation system pose the institutions of knowledge production. This shall concentrate attention on the intelligence of the application platforms assembled by cities across the world as urban and regional innovation systems. Urban and regional innovation systems that optimize energy consumption as locally produced renewables. Locally produced renewables, which are smart in sustaining the development of homes and neighborhoods as the net zero energy districts and climate neutral communities of cities under the S4 of the fourth industrial revolution.

References:

[1] Deakin, M., 2011. The embedded intelligence of smart cities. Intelligent Buildings International, 3 (3): 89-197.
[2] Deakin, M. (ed.) 2012. From intelligent to Smart Cities, Routledge, UK.
[3] Deakin. M. (ed.) 2013. Smart Cities: Governing, Modelling and Analysing the Transition, Routledge, London.
[4] Deakin, M. 2014. Smart Cities: the State-of-the-Art and Governance Challenge, Triple Helix, 1, (1): 1-17.
[5] Deakin, M., 2015. Smart cities and the internet: From mode 2 to triple helix accounts of their evolution. In Handbook of Research on Social, Economic, and Environmental Sustainability in the Development of Smart Cities (pp. 26-43). IGI Global.
[6] Deakin, M. 2018. Smart Cities, Metrics and the Future Internet-based Governance of Urban and Regional Innovations, Scienze Regionali, 17, 1, pp. 39-56.
[7] Deakin, M. 2022. Triple, Quadruple and N-Tuple Helices: the RIS3 and EDP of a higher-order policy model. Triple Helix, 9(1), pp.32-42.
[8] Deakin, M. and Leydesdorff, L., 2014. The triple helix model of smart cities: a neo-evolutionary perspective. Smart cities: Governing, Modelling and Analysing the Transition, pp.134-149.
[9] Deakin, M and A. Reid, 2018. Smart Cities: Under-gridding the Sustainability of City-districts as Energy Efficient - Low Carbon Zones, J. Clean. Prod. 173, pp. 39-48.
[10] Deakin, M; Reid, A. and Mora, L. 2020. Smart Cities: The Metrics of Future Internet-Based Developments and Renewable Energies of Urban and Regional Innovation, Journal of Urban Technology, 27, pp. 59-78.
[11] Deakin, M and Reid, A. 2023. Smart cities as future internet-based developments that adapt to climate change and which green the intellectual capital of urban and regional innovation systems, Lecture Notes in Computer Science (LNCS, volume 14011), Springer, Berlin.

Candidate characteristics

Education:

A second class honour degree or equivalent qualification in innovation systems, urban and regional studies, environmental science

Subject knowledge:

- Urban and regional innovation systems

Essential attributes:

- Good knowledge of smart city trajectories, evolutionary models able to link them to the structural dynamics of urban and regional innovation systems and

connection these in turn have to sustainable development of climate change adaptations.

Desirable attributes: