



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://blogs.napier.ac.uk/scebe-research/available-phd-student-projects/>

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: Sana Ullah Jan (Email: S.Jan@napier.ac.uk)
- 2ND SUPERVISOR: Bill Buchanan

Subject Group: Cyber-security and system engineering

Research Areas: Artificial Intelligence and Machine Learning

Project Title: Data-driven generative AI for sensor fault prediction in distributed networks

Project description:

In the age of the Internet of Things (IoT), the quantity of devices with the ability to perceive their surroundings is growing continuously. Various services and systems now rely on the data gathered by these devices for making crucial decisions. As a result, the need for accurate data is paramount. However, given the challenging operating conditions, the likelihood of sensor malfunctions is substantial. Consequently, the identification of data irregularities originating from sensors is of great significance. The objective of this project is to develop a robust smart autonomous system for detecting or possibly predicting faults by monitoring the data obtained from IoT devices within a distributed network while ensuring the

integrity, security and privacy. By achieving this objective, we can enhance the reliability and trustworthiness of the data that underpins decision-making processes in IoT-based services and systems. The following key components will be addressed while working toward the final objective.

1. Data collection and pre-processing
2. Developing machine learning-based fault detection/prediction algorithm
3. Scalability and Adaptability Analysis

References:

Candidate characteristics

Education:

A first-class honours degree, or a distinction at master level, or equivalent achievements in Computer Science, Mathematics, Statistics, Engineering, or related field

Subject knowledge:

- Fundamentals of Programming

Essential attributes:

- Motivated to do PhD