



## **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 Naser Ojaroudi Parchin (Email: [N.OjaroudiParchin@napier.ac.uk](mailto:N.OjaroudiParchin@napier.ac.uk))
- 2<sup>ND</sup> SUPERVISOR: tbc

**Subject Group:** Cyber Security and System Engineering

**Research Areas:** Engineering & Computer Science

**Project Title:** Intelligent Metamaterials/Metasurfaces for 5G/6G Wireless Networks

#### **Project description:**

Within the framework of 5G/6G infrastructure, advancements in addressing solutions and service extensions pave the way for innovative technologies like Intelligent Metamaterials and Metasurfaces systems. These systems enhance connectivity, sensing, and monitoring within smart radio environments.

This project is dedicated to refining Intelligent Metamaterials/Metasurfaces, making them highly adaptable, multi-functional, and autonomous while ensuring they remain cost-effective and straightforward. The endeavor involves pioneering designs and techniques, including novel unit cells designed for compactness in both passive and active modes. Additionally, the project employs advanced tools such as CST, ADS, and MATLAB for generic system-level simulation and multi-physics modeling. This approach encompasses coding optimization and artificial intelligence (AI) analysis of the metamaterial/metasurface operations. Promising

designs will undergo implementation and testing under diverse wireless sensing scenarios, contributing to the evolution of intelligent and efficient 5G/6G wireless communication systems

## **Candidate characteristics**

### **Education:**

A second class honour degree or equivalent qualification in Electrical and Electronic Engineering, or Computer Engineering

### **Subject knowledge:**

- Antenna systems
- Metamaterials
- Signal Processing
- CAD tools

### **Essential attributes:**

- Knowledge of Microwave Engineering
- Good written and oral communication skills
- Strong motivation, with evidence of independent research skills
- Good time management