



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: Hongnian Yu (Email: H.Yu@napier.ac.uk)
- 2ND SUPERVISOR: Dr Pelagia Koufaki

Subject Group: Cyber-security and system engineering

Research Areas: Computer Science, Engineering

Project Title: Smart Multi-Sensor Instrument for Personalized Assessment of Gait and Stability in Elderly and Frail Individuals

Project description:

This research project aims to design, develop, and evaluate a smart multi-sensor instrument capable of personalized gait and stability assessments. Using AI approaches, the collected data will be analysed to identify and assess risks associated with physical frailty (PF) and the occurrence of falls.

Background: Falls are a significant concern, with 28%-35% of individuals aged 65 and over experiencing at least one fall annually. PF is recognized as a key biological and behavioural risk factor for falls, leading to disability, social and mental dysfunction, and increased morbidity.

Objective: This research project addresses the growing need for sustainable and cost-effective solutions to support the elderly population's desire for independent living while mitigating the risks associated with falls, fractures, and hospital admissions. It leverages the collaborative efforts of researchers and clinical experts from Edinburgh Napier University (ENU) and Queen Margaret University (QMU) in collaboration with Royal Bournemouth Hospital for a joint PhD research program.

Research Focus: The project will investigate the dynamic relationship between physical movement during activities of daily living (ADLs) in a home environment and outcomes like falls, related injuries, and overall health and well-being. State-of-the-art wearable devices and advanced data analysis methodologies will be utilized to gain novel insights into the ADLs of elderly and frail individuals.

References:

Candidate characteristics

Education:

A second class honour degree or equivalent qualification in Computing, Computing Engineering, Control Engineering, Electronics and Electrical Engineering, Robotics, or Mathematics.

Subject knowledge:

It is expected that the candidate should have good fundamental knowledge in one or more of the following subjects:

- Computing
- Computing Engineering,
- Control Engineering,
- Electronics and Electrical Engineering,
- Robotics,
- Mathematics,
- or Health and Exer

Essential attributes:

- Good written and oral communication skills
- Strong motivation, with evidence of independent research skills relevant to the project
- Good time management

Desirable attributes:

- Experiences in sensor technology and data analysis
- Component in statistics and data modelling
- Knowledge of applied statistics
- Knowledge in robotics and intelligent control