



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 Simon Smith (Email: S.Smith2@napier.ac.uk)
- 2ND SUPERVISOR: TBC

Subject Group: Engineering & Mathematics

Research Areas: Artificial Intelligence, Machine Learning, Robotics

Project Title: Robot Learning for Robust Control

Project description:

Robots will be part of our everyday life. They will support us in tasks that are complex, dangerous or repetitive. In the last decade, we have seen how robots can solve complex tasks if appropriately trained. These advances make them closer to the goal of deploying them alongside humans. However, these robots are still not robust enough for us to trust them. Our robots must be robust to external perturbations and adaptive to changes in the environment and their configuration, e.g., physical damage. In this project, you will study state-of-the-art robotic learning paradigms like machine learning or evolutionary computation and develop novel algorithms for robust and adaptive control. The robots controlled with these algorithms will solve complex tasks like navigation on rough terrain or manipulating objects while remaining robust and adapting to unforeseen scenarios. You will work with our newly acquired quadrupeds, hexapods and robotic arms. You will have access to our new High-Performance Computer facilities for computationally demanding learning algorithms. The project includes publishing in high-tier

conferences and journals. Also, there will be opportunities for the student to attend summer/winter schools in other universities.

Candidate characteristics

Education:

A first-class honours degree, or a distinction at master level, or equivalent achievements in Computer sciences, engineering, mathematics or physics.

Subject knowledge:

- Mathematics

Essential attributes:

- Proactive person willing to work with physical robots. Having the will to learn programming, robotics and dynamical systems theory.

Desirable attributes:

- We expect the candidate to showcase their work to colleagues in venues like workshops and conferences.