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: Sarah L, Thomson (Email: S.Thomson4@napier.ac.uk)
- 2ND SUPERVISOR: Emma Hart

Subject Group: Computer science

Research Areas: Computer Science -> Artificial Intelligence/Data Science

Project Title: Understanding the True Nature of Fitness Landscapes in Evolutionary Computation

Project description:
Fitness landscape analysis in evolutionary computing has been used for decades to better understand optimisation problems, optimisation algorithms, and how the two interact together. A fitness landscape is a topological model of the interplay between a problem and an algorithm. Despite a wealth of existing literature, landscape analysis techniques are often computationally expensive or sensitive to sampling bias. The vision of this PhD is to work towards an in-depth understanding and analysis of existing landscape metrics, and to propose and test new metrics (or sets of metrics) to help in characterising fitness landscapes. The disadvantages of current landscape approaches will be addressed and hopefully reduced. At the

end of the PhD, is it hoped that a better understanding of fitness landscape analysis will have been gained.

References:

Candidate characteristics

Education:
A second class honour degree or equivalent qualification in Computing Science, Computer Science, Artificial Intelligence, Data Science

Subject knowledge:
- Analysing and visualising data
- Artificial intelligence

Essential attributes:
- Strong programming skills
- Self-motivated
- A passion for learning
- Excellent standard of academic writing

Desirable attributes:
- Some knowledge of metaheuristic algorithms or evolutionary computation