

Research Fellow

Role Description

Grade & Salary:	Grade 5 £32,816 -£39,152
Campus Location:	Merchiston
Line Manager:	Emma Hart
Role Summary:	This post is a 3.5 year, fixed-term Research Fellow to work on a project “Keep Learning” that will develop an optimisation system for solving combinatorial and constrained problems. The system "keeps- learning" in response to a continual instance-stream, rapidly producing optimised solutions to instances and situations that go beyond those envisaged at initial design. The project integrates approaches from meta-heuristic search methods and constrained optimisation with machine-learning techniques. The post is part of a joint research project in collaboration with the University of St Andrews, supported by the UK Engineering and Physical Sciences Research Council (EPSRC).

Main Duties and Responsibilities

➤	Conduct research under the supervision of senior colleagues to design, implement and evaluate novel machine-learning and evolutionary mechanisms that (1) predict future characteristics of instances based on past history (2) generate new instances based on predicted features (3) apply meta-heuristic methods to generate new solvers (4) Implement algorithm-selection methods (5) implement novel methods to enable continual adaptation of the system based on past experiences
➤	Preparation of peer-reviewed publications for quality conferences and journals and dissemination of research results at international and national conferences.
➤	Plan and manage own research activity in collaboration with other project members and ensure that research outputs are delivered in accordance with the project plan
➤	Participate in external research networks or appropriate events in order to build new relationships, exchange ideas and disseminate findings, including public engagement activity
➤	Regular liaison with the project partners at the University of St Andrews, including week-long research visits
➤	Develop and/or contribute to proposals to secure future research funding
➤	Undertake other research-related activities as appropriate to the Nature-Inspired Intelligent Systems Group
➤	Be responsible for ensuring that the information and records processed (received, created, used, stored, destroyed) on behalf of the University are managed in compliance with ALL applicable legislation, codes and policies e.g. Data Protection , Information Security and Records Management .

Person Specification

Attributes	❖ Essential Selection Criteria	Desirable Selection Criteria
Education/Qualifications	A PhD in a relevant research area such as meta-heuristic optimisation, self-adapting systems, machine-learning or equivalent relevant demonstrable research experience	
Experience	<p>Demonstrable experience of conducting research in the field of optimisation</p> <p>Demonstrable experience and/or good knowledge of meta-heuristic search algorithms</p> <p>Demonstrable experience and/or good knowledge of machine-learning methods for prediction</p> <p>Working in a team to deliver research</p> <p>A strong publication track-record demonstrating ability to write up research work for high-profile publications</p>	<p>Experience of working with algorithm or heuristic generation methods such as Genetic Programming</p> <p>Experience or knowledge of machine-learning techniques for prediction, including feature-selection methods, particularly in relation to time-series data</p> <p>Knowledge of constraint-based optimisation methods, including exact solvers</p>

Skills/Personal Requirements

Excellent skills in experimental design, experimental practice and rigorous data analysis

Excellent programming skills

Excellent data-analysis skills

Experience of carrying out both independent and collaborative research;

Ability to work in a team

Highly developed communication skills, to engage effectively with a wide-ranging audience, both orally and in writing, using a range of media.

Excellent time-management skills

Proven ability to generate and implement new ideas.

Very good programming skills, e.g. in Python, Java or C++

Experience of using Python for data-analysis

Experience of using standard machine-learning libraries, e.g. in Python