



Engaging Content  
Engaging People



<b>Research Centre</b>	ADAPT SFI Centre for Digital Media Technology
<b>Post Title</b>	Postdoctoral Researcher in Knowledge Engineering for Healthcare Risk
<b>Level on Framework:</b>	Level 1
<b>Post Duration</b>	Fixed Term Contract up to 24 Months

### **Dublin City University**

Dublin City University [www.DCU.ie](http://www.DCU.ie) is a young, ambitious and vibrant University, with a mission 'to transform lives and societies through education, research, innovation and engagement'. Known as Ireland's 'University of Enterprise and Transformation', it is committed to the development of talent, and the discovery and translation of knowledge that advances society and the economy. DCU is the Sunday Times Irish University of the Year 2021.

The University is based on three academic campuses in the Glasnevin-Drumcondra region of north Dublin. It currently has more than 18,000 students enrolled across five faculties – Science and Health, DCU Business School, Computing and Engineering, Humanities and Social Sciences and DCU Institute of Education. DCU is committed to excellence across all its activities. This is demonstrated by its world-class research initiatives, its cutting-edge approach to teaching and learning, its focus on creating a transformative student experience, and its positive social and economic impact. This exceptional commitment on the part of its staff and students has led to DCU's ranking among the top 2% of universities globally. It also consistently features in the world's Top 100 Young Universities (currently in QS Top 70 Under 50, Times Higher Top 150 Under 100).

DCU is placed 84th in the world, in the Times Higher Education University Impact Rankings – measuring higher education institutions' contributions towards the UN Sustainable Development Goals. Over the past decade, DCU has also been the leading Irish university in the area of technology transfer, as reflected by licensing of intellectual property.

### **Research Career Framework**

As part of this role the researcher will be required to participate in the DCU Research Career Framework (<http://dcu.ie/hr/ResearchersFramework/index.shtml>). This framework is designed to provide significant professional development opportunities to researchers and offer the best opportunities in terms of a wider career path.

### **Background and Role Profile**

The ADAPT research agenda pioneers and combines research in AI focused technologies: Natural Language Processing, Video/Text/Image/Speech processing, digital engagement & HCI, semantic

modeling, personalisation, privacy & data governance. The ADAPT Centre and the ARK-Virus COVID project, sponsored by Science Foundation Ireland in the ADAPT Centre at Dublin City University, is seeking a research fellow in knowledge engineering for Healthcare Risk and Safety governance for an up to 24 month fixed-term contract to support the development of the ARK knowledge management platform for clinical risk governance and the ADAPT Value and Risk research challenge.

The ARK project is conducted jointly with researchers from the Centre for Innovative Human Systems (CIHS) in the School of Psychology in Trinity College Dublin and St James's Hospital, Dublin Fire Brigade, Stewards Care, Tusla and Beacon Hospital. The ARK platform delivers evidence-based risk management capabilities to PPE deployment and IPC (infection prevention and control) within organisations. This project aims to create a knowledge base of PPE best practice supported by a viable technical platform. The knowledge management and extraction challenges include dealing with a diversity of structured and unstructured data from reports, risk assessments, human factors and operational data analytics. New models of data representation and processing are required to support and automate manually focused socio-technical analysis techniques developed at CIHS over the last 20 years.

The role will also include taking a leadership role the ARK-Virus project based on leveraging knowledge engineering of Linked Data together with AI and machine learning to build next generation information systems that include reasoning, natural language processing and information retrieval techniques

### **Opportunity**

This project presents the successful candidate with the opportunity to work in an exciting, fast moving and excellent technical environment, playing a leading role in a research project. The motivation of the team is to grow this research-led initiative into effective commercialisation of the research work products

### **Principle Duties and Responsibilities**

Reporting to the ARK-Virus project Principal Investigator, the Postdoctoral Researcher will:

- Research new semantic representations of clinical safety information that support socio-technical analysis, knowledge distillation and federation. This shall include creating new knowledge models, methods and rules to support socio-technical analysis of organisations, projects and operations in a way that is reusable across multiple domains such as aviation and healthcare and supports a variety of workflows for operational and strategic risk governance.
- Design new methods and tools for an efficient data processing pipeline for the ARK platform that can collect, integrate, verify and export clinical risk information from many heterogeneous sources. This shall include the application of natural language processing

techniques to data uplift and ingestion of human-oriented loosely structured data such as risk reports.

- Engage regularly and effectively with project partners, user groups and clinicians
- Produce top-quality journal and conference publications, in collaboration with other project members.
- Supervise and mentor junior staff on research and on good software development practices (e.g requirements analysis, source control)

The above list of job duties is not exclusive or exhaustive and the successful candidate will be required to undertake such tasks as may reasonably be expected within the scope and grading of the post.

### **Minimum Criteria**

The candidate must have a PhD in Computer Science or a related discipline

In addition, it is desirable that the successful candidate has a subset of the following skills and experience:

- Experience in developing scalable and robust software solutions for working with Linked Data datasets.
- Strong technical skills, including at least two of:
  - o Databases: MySQL, Apache Jena triplestore or other graph database technologies.
  - o Web development: HTML, CSS, Javascript (NODE.js, JQuery, React, D3.js or other similar libraries). Python and Java
- Experience working with healthcare safety management communities to turn requirements into viable systems
- A strong publication record of international peer-reviewed publication and presentation in top-tier conferences and journals.
- Excellent research skills with experience in: Semantic Web, or Linked Data.
- Knowledge engineering project implementations, especially using OWL and SKOS.
- Experience developing knowledge interlinking and collection interfaces for non-knowledge engineers
- Experience working with clinical teams and knowledge of healthcare safety systems.
- Full stack development, client and server-side development including database layer (e.g. Javascript, Apache Jena)
- Creating new knowledge models, methods and rules to support analysis of organisations, projects and operations (OWL, RDF, Protégé, Risk Analysis, CUBE analysis)
- Knowledge of architectural patterns for distributed data architectures

- Methods and tools for designing efficient data processing pipelines for structured and semi-structured data (R2RML, data quality frameworks).
- Ability to communicate effectively both written and verbally and interpersonal skills.

**Mandatory Training:**

The post holder will be required to undertake the following mandatory compliance training: Orientation, Health and Safety and Intellectual Property and Data Protection training. Other training may need to be undertaken when required.

**Candidates will be assessed on the following competencies:**

**Discipline knowledge and Research skills** – Demonstrates knowledge of a research discipline and the ability to conduct a specific programme of research within that discipline

**Understanding the Research Environment** – Demonstrates an awareness of the research environment (for example funding bodies) and the ability to contribute to grant applications

**Communicating Research** – Demonstrates the ability to communicate their research with their peers and the wider research community (for example presenting at conferences and publishing research in relevant journals) and the potential to teach and tutor students

**Managing & Leadership skills** - Demonstrates the potential to manage a research project including the supervision of undergraduate students