



Research Centre	School of Electronic Engineering
Post Title	Postdoctoral Researcher in Data Analytics, Machine Learning and Large Scale Sensor Data Management.
Level on Framework	Level 1
Post Duration	Fixed-Term Contract up to 22 months

Research Career Framework

As part of this role the researcher will be required to participate in the DCU Research Career Framework. This framework is designed to provide significant professional development opportunities to Researchers and offer the best opportunities in terms of a wider career path. The role may include teaching duties to assist with module delivery.

Overview

Dublin City University (www.dcu.ie) is a research intensive, globally engaged, dynamic institution which has developed its own research specialists, established internationally recognized centres of excellence that have substantive collaborative links with leading universities and industrial partners. DCU is distinguished both by the quality and impact of its graduates and by its focus on the translation of knowledge into societal and economic benefit. Through its mission to transform lives and societies through education, research and innovation DCU acts as an agent of social, cultural and economic progress. DCU is Ireland's fastest growing university and now hosts more than 17,000 students across its three academic campuses: DCU Glasnevin Campus, DCU St Patrick's Campus and CU All hallows campus. DCU has a strong track record in attracting both Irish and European Union research funding under Horizon 2020 (and all previous Framework Programmes), Marie Curie Actions and Erasmus. We offer a dynamic and internationally-focused environment in which to advance your academic career.

Background and Role

The School of Electronic Engineering is seeking to appoint a highly motivated Postdoctoral Researcher to undertake cutting edge research in the area of Data Analytics, Machine Learning and Large Scale Sensor Data Management. The successful applicant will join a multidisciplinary team to work in liaison with current researchers on Terrain-AI SFI funded project. Now, more than ever, we need high-quality, timely information about our farms, forests, natural wetlands and cities in order to better understand the interdependencies and interactions between the human activities and natural processes that create these complex environments.

This SFI funded project in the area of climate action will tackle this challenge through the innovative fusion of multi-thematic data-sources captured from space-borne satellites, aerial/drone platforms, in-field instruments, in-situ sensor networks and mobile devices with existing databases, on land use and population, using highly automated Machine Learning workflows to extract terrestrial features,

patterns and processes essential to understanding and managing these environments. Integrated land-surface models, capable of handling uncertainty, will utilise these AI outputs together with land-cover type, biomass and environmental variables to produce improved estimates of Carbon Stocks and Exchanges.

The ideal candidate will have experience working in the area of data analytics over IoT-based sensor data streams including data acquisition from sensors, data integration, large-scale data management, and application of AI and machine learning algorithms for multi-modal integrated sensor data streams. The individual will work on a project funding received from Science Foundation Ireland under the strategic partnership programme, with co-funding from Microsoft for a project in the area of climate action. The project team will have an opportunity to work closely with our industry partners to pursue goal-oriented research.

Principal Duties and Responsibilities

The successful candidate will

- Conduct research in the area of data science/engineering and AI for developing, testing, and benchmarking proposed solutions for Terrain-AI under the supervision and direction of the Principal Investigators.
- Liaise with both internal and external stakeholders including industry and academic partners/collaborators to accomplish project deliverables and milestones.
- Collate and integrate existing databases and handle large volumes of multi-thematic datasets and sensor data streams.
- Design highly flexible and dynamic ML workflows for multi-modal and multi-disciplinary datasets.
- Train and apply ML algorithms for analysis and prediction over integrated data.
- Build proof of concept demonstrators showcasing research outcomes and deploy these solutions in real industrial settings.
- Assist in identifying and developing future research and funding initiatives
- Engage in the dissemination of the results of the research in which he/she is engaged with the support of and under the supervision of the Principal Investigator
- Supervise and assist undergraduate students working in this area with their research
- Engage in appropriate training and development opportunities as required by the Principal Investigator, the School or Research Centre, or the University
- Engage in teaching and teaching support as assigned by the Head of School under the direction of the Principal Investigator
- Carry out administrative work associated with the programme of research as necessary

Minimum Criteria

Applicants should have a PhD in Computer Science or related field with some relevant experience at postdoctoral level being preferable.

In addition, it is desirable that the candidate has experience in some of the following areas:

- Knowledge of a broad area of data science and data engineering with experience of managing and analysing big datasets.
- Strong programming skills in Java and/or at least one other programming language (C, C++, Python, Scala).
- Ability to work in a team-based environment developing state of the art software solutions on time and to specification.

- Ability to conduct multi-disciplinary research and understanding of various domains particularly terrestrial and climate related issues.
- Motivated and proactive attitude, willing to take ownership and initiative in all work assignments.
- Excellent analysis and problem-solving skills.
- Excellent communication skills, verbal and written (English).
- Creative Thinking.
- Experience in working on cloud based solutions for application of AI on large dataset e.g. Microsoft Azure.
- Knowledge of open source and distributed solutions and architectures for big data.
- Hands-on experience of working on cloud infrastructures and micro-services.
- General understanding of Machine Learning techniques and state of the art tools.
- Experience in research collaborations with industry.

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 convey 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.

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.