

Research Centre:	Insight SFI Research Centre for Data Analytics
Post Title:	Postdoctoral Researcher - Solarmap
Level on Framework:	Level 1
Post Duration:	Fixed Term Contract up to 6 months

Background:

The Insight SFI Research Centre for Data Analytics (<http://www.insight-centre.org>) is an SFI funded Research Centre which brings together researchers from University College Dublin, NUI Galway, University College Cork, and Dublin City University, as well as other partner institutions, Trinity College Dublin (TCD), University of Limerick (UL), Maynooth University (MU) and Tyndall National Institute. It creates a critical mass of more than 400 researchers from Ireland's leading ICT clusters to carry out research on a new generation of data analytics technologies in a number of key application domain areas, such as Health and Human Performance, Smart Communities, Internet of Things, Enterprise and Services and Sustainability and Operations.

The €150m Centre is funded by Science Foundation Ireland and a wide range of industry and European Union partners. Insight's research focus encompasses a broad range of data analytics technologies from machine learning, decision analytics and social network analysis to linked data, recommender systems and the sensor web. Together, with more than 220 partner companies, Insight researchers are solving critical challenges in the areas of Connected Health and the Discovery Economy.

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.

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 you can advance your academic career.

The Project:

By 2050 the global population is projected to be 9.8 billion and between 70 and 80% will live in cities. This will present challenges for resources. Urban environments use large amounts of electricity, placing significant pressures on these important resources. Climate change and a rising population will increase this demand up to 2050 and beyond. The Irish government has outlined a strategy in mitigation and adaptation to help address the issue of climate change. However, there is an urgent need to examine solar prospecting in Urban areas. Currently, almost no electricity is produced in Dublin city despite the large amount of roof space, particularly in the light industrial zones on the

edges of the city. This project (SolarMap) will focus on the use of geospatial and ICT technologies to develop solutions to this resource issue. The principal aim is to use Geospatial & ICT technology to identify areas suitable for urban solar farming and to model the spatial extent and efficiency of those farms, firstly in Dublin and subsequently in other urban areas.

The candidate for this position must have an excellent background in Geospatial processing and analysis. The ideal candidate will have a PhD. Geospatial technologies and analysis, or similar. The candidate will work under the guidance of Dr. John Connolly in the DCU Geospatial Research Group (School of History and Geography) and Prof. Noel O Connor in Insight & Enable. The ability to work effectively as part of a team is essential for this post. The candidate must also be self-motivated, have excellent communication skills (including writing and presentation skills). The candidate may be required to work with external experts from time to time. There may be opportunities for teaching experience during the post. The successful candidate will be Dublin based and may be required to take part in courses overseas during the duration.

The Role:

This is a research focused role, where you will conduct a specified programme of research supported by research training and development under the supervision and direction of a Principal Investigator. The primary purpose of the role is to further develop your research skills and competences, including the processes of publication in peer-reviewed academic publications, the development of funding proposals, the mentorship of graduate students along with the opportunity to develop your skills in research led teaching.

This is a joint project between the Insight SFI Research Centre for Data Analytics, Enable and the School of history and Geography. The project will help the research centre deliver on its research goals. The Insight and Enable centres bring together a team of researchers representing a wide variety of disciplines seeking to comprehend urban environments through various Smart initiatives such as Smart Dublin and Smart Stadium. Insight and Enable are funded by Science Foundation Ireland (SFI) as well as industry partners. Insight is a collaboration between DCU, UCD, NUIG, UCC, NUIM, TCD, RIA and Tyndall.

Principle Duties and Responsibilities:

Specific duties include:

- Conduct a specified programme of research and scholarship under the supervision and direction of your Principal Investigator.
- Engage in appropriate training and professional development opportunities as required by your Principal Investigator, your School or Institute, or the University.
- Engage in the dissemination of the results of the research in which you are engaged as directed by and with the support of and under the supervision of your Principal Investigator.
- Engage in the wider research and scholarly activities of your research group, School and Institute.
- Mentor and assist, as appropriate and as directed, the research graduate students in your group, School and Institute.
- Carry out administrative work associated with your programme of research.

In addition to the Principal Duties and Responsibilities listed above, the successful candidate will also carry out the following duties; specific to this project:

- Collection, collation and analysis of relevant data including Earth Observation (EO) data (from UAV to Satellite).
- Construct 3D models of urban areas, using industry standard software
- Generate heat maps identifying areas of high potential
- Investigate the use of Building Information Modelling (BIM) and BIM derived from EO to extend areas of analysis
- Investigate the use of LiDAR / EO data for rooftop assessment
- Liaise with other Insight and Enable researchers and other collaborations in the centre.
- Engage in appropriate training and professional development opportunities as required by your supervisors, your School or Institute, or the University.
- Engage in the dissemination of project results with the support of and under the supervision of your Principal Investigators

Minimum Criteria:

The successful candidate must hold a PhD in Geography, Remote Sensing, Geospatial technologies or related field.

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

- A demonstrated commitment to research and publications
- An understanding of the operational requirements for a successful research project
- Evidence of research activity (publications, conference presentations, awards) and future scholarly output (working papers, research proposals, and ability to outline a research project)
- Excellent Communication Skills (Oral, Written, Presentation etc)
- Excellent Organisational and Administrative skills including a proven ability to work to deadlines
- Advanced expertise in remote sensing and geospatial analysis
- Practical knowledge of the broad range of EO data
- Experience in the use of state-of-the-art software for GIS analysis and spatial modelling (image processing, data visualisation)
- Candidates must demonstrate an awareness of equality, diversity and inclusion agenda
- Expertise in the solar prospecting in urban areas or similar analysis in urban areas.
- Experience working within, or collaborating with, industry.
- Knowledge of the urban environment in Ireland.
- Experience with coding in Python, JavaScript or R.
- Experience in machine learning.
- Experience in setting own research agenda

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