Insight SFI Research Centre for Data Analytics

Post Title: Postdoctoral Researcher in Image understanding using machine learning

Level on Framework: Level 1

Post Duration: Fixed Term Contract up to 48 months

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.

Insight SFI Research Centre for Data Analytics

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.
The Project and Role

The project is a collaborative project between the Insight SFI Research Centre for Data Analytics and Xperi Fotonation which aims to solve problems in the area of Machine Learning and image understanding. The successful candidate will split their time (50:50) between the Insight Centre, DCU and the Xperi Fotonation offices in Galway. Prioritized research goals will be aligned with some of the following topics: advancements in image enhancement using ML, learning from limited training data, joint video and audio analytics using ML, low power ML and artificial intelligence algorithms on the edge, adversarial attacks on recognition systems, new approaches to visual saliency prediction and applications, among others.

Principle Duties and Responsibilities

Specific duties include but are not limited to

- Conduct a programme of research into machine learning and image understanding
- Provide support and advice to a group of four PhD students working on similar topics.
- Assist the Principal Investigators (PIs) in supervising the PhD students to completion
- Assist the Principal Investigators (PIs) in overseeing software and system development for the various PhD projects.
- Act as a liaison between the PIs, the Insight Centre and the industry partner.
- Produce top quality high impact journal and international peer-reviewed conference publications, in partnership with the PIs.
- Participate in Insight Centre activities, including industry showcases, annual reviews and industry and agency visits to the Insight labs.
- Carry out administrative work associated with the programme of research as necessary
- Engage in appropriate training and development opportunities as required by the PIs, the School or Research Centre, or the University.
- Other tasks relevant to successfully implementing the assigned research programme.

Qualifications, Skills and Experience Required

The ideal candidate will have a PhD in Computer Science, Engineering or a related discipline with strong software and programming skills and relevant experience in computer vision, deep learning, or collaborative filtering.

In addition, ideally the candidate should possess the following skills;

- Programming and software development: especially in Python and C/C++, and experience in numerical and scientific computing in Python or MATLAB.
- Mathematical skills: advanced linear algebra, probability and statistics, multivariate calculus, and mathematical optimization.
- Theoretical and applied machine learning: especially deep learning, and knowledge of unsupervised or semi-supervised methods in deep learning.
- Software frameworks for deep learning: e.g. PyTorch or Tensorflow
- Computer vision theory and algorithms.
- Various operating systems, especially GNU/Linux.
- Excellent written and oral proficiency in English (essential).
- Excellent written and verbal communication and interpersonal skills.
- Proven ability to actively prioritize workload and confident to work to strict deadlines.
- Ability to work in a team and also independently contribute to the overall success of the team.
- Strong problem solving abilities.

**Mandatory Training**
The post holder will be required to undertake the following mandatory compliance training: Orientation, Health and Safety, Research Integrity 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