Insight Centre for Data Analytics
Research Masters Student - Prof Alan Smeaton and Dr Aoife Morrin
2 year position starting September/October 2019

Background
The Insight 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), National University of Ireland, Maynooth (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 Opportunity
The INSIGHT Centre for Data Analytics, funded by Science Foundation Ireland at Dublin City University are seeking candidates for a fully-funded 2-year funded research Masters project to perform analytical chemistry-based research to contribute to the understanding of indoor air quality, specifically as it relates to the use of 3D printer technology. Ultimately, this research will underpin the future development and testing of guidelines for indoor air quality management in settings where 3D printers are increasingly being used in schools, homes, and workplaces.

Background & Role
The focus will be on personal exposure to both particulates (PM2.5 and smaller, including ultrafine particles (UFPs)) and volatile organic compounds (VOCs) which are output from 3D printing machines. The project will use gas chromatography-mass spectrometry (GC-MS) initially to analyse VOC emissions from instrumentation housed in DCU additive manufacturing laboratories. In-situ and off-the-shelf sensors including lasers for particulates as well as VOCs will also be deployed. Based on this, new wearable indoor air monitoring sensors will be developed in this project where novel technologies and materials will be used. These new
wearables will be capable of tracking personalised exposure to 3D printing emissions. The sensors will ultimately include person-tracking technology, pinpointing precisely the location and activity of the person at a given point in time within the 3D printing environment. The project will gather usage logs for all additive manufacturing (AM) devices in the test laboratory and combined with a 3D model of the lab, including placement of AM machines and their exhaust characteristics, a multimodal record of lab activities over time can be created. From this, we can characterise precise personalised air pollution exposure parameters for laboratory occupants. We will replicate this in other AM labs and use this as a basis for guidelines for indoor air quality management where 3D printers are used.

Overall, the MSc student will contribute to the understanding of emission profiles from 3D printers and apply this knowledge for the development of wearable air pollution monitoring sensors and technology for people who work with, or visit 3D printer facilities (e.g. university, school or home) to help mitigate the exposure risks associated with this new technology.

Eligibility
Candidates holding a BSc equivalent to a second-class honours, grade two, may apply for entry on the research Master’s register at DCU. A focus or experience in analytical chemistry and/or 3D printing would be ideal. English language requirements for non-native speakers of English are available here: https://www.dcu.ie/registry/english.shtml

Application
• All expressions of interest, to include CV and cover letter detailing your interest (in PDF only), are to be submitted by email to recruitdcu@insight-centre.org by Friday 23rd August 2019.
• Please clearly state the role that you are applying for in your application and email subject line: 1901 Research Masters Position
• Interviews will be carried out towards the end of August 2019.
• The successful candidate is expected to start in September/October 2019.