PhD Studentship in Analysis and Visualisation of Geo-Referenced Big Health Data

Applications are invited for the Department for the Economy (DfE) funded PhD studentship tenable in the Faculty of Computing and Engineering at the Jordanstown Campus.

Project Summary:

The World Health Organization defines a healthy community as 'one that is safe with affordable housing and accessible transportation systems, work for all who want to work, a healthy and safe environment with a sustainable ecosystem, and offers access to health care services which focus on prevention and staying healthy.' A key focus in the University's proposed strategy encompassing Civic Contribution is in support of these healthy communities, including 'mental health, ageing, health innovation and policy, sport for life, history and heritage.' This proposal therefore fits into the healthy communities' research theme.

Understanding health and wellbeing is important at a global level as well as at a regional level in Northern Ireland. The work undertaken in this PhD project will use open data together with social media data to explore, analyse, and visualise health and wellbeing across the geography of Northern Ireland.

Northern Ireland is now a producer of significant sets of open data relating to wellbeing and health including, for example, prescription data at GP practice level, which can be harnessed with census data relating to, for example, electoral ward level measures of deprivation and health. Approximately 1 in 5 messages from social media datasets (e.g. Twitter, Facebook, Instagram, etc.) include geo-locational data, which provide an opportunity to analyse and identify geospatial patterns.

The work undertaken in this PhD project will firstly develop a data warehouse to collate and maintain open and social media data. The data will then be provisioned for analysis using novel machine learning algorithms, specifically designed to manage and exploit the interrelationships between open and social data. All data will be processed to ensure that individuals cannot be identified. It will also be marked up semantically and data will be exposed for external use via a simple Application Programming Interface (API). This will result in an open, experimental platform capable of discovering temporal, geospatial, and other patterns of health and wellbeing, as well as visualising such patterns using appropriate interactive visualisation tools. The platform will be used to explore research questions relating to the geography of health and wellbeing across Northern Ireland.

The challenge in this PhD studentship is two-fold. Firstly, the successful applicant will work with the computer science supervisory team to construct the necessary software platform. Secondly, the supervision team will work with the successful applicant to co-create and refine the research questions. The computing academics will provide expertise in current computer science topics including software development, data analytics, and visualisation, as well as emerging topics such as visual analytics. Candidates would be expected to use one or more of the following software technologies: Social media Application Programming Interfaces (API) including Twitter, GIS tools such as GeoServer, R programming with R Studio, Python, Ushahidi, Tableau and D3.JS.

Entrance Requirements:

Candidates should have ordinary UK residence to be eligible for both fees and maintenance. Non UK residents who hold ordinary EU residence may also apply but if successful will receive fees only. All applicants should hold a first or upper second class honours degree in Computer Science or a cognate area. Applications will be considered on a competitive basis with regard to the candidate's qualifications, skills experience and interests. Successful candidates will enrol as of April 2017, on a full-time programme of research studies leading to the award of the degree of Doctor of Philosophy.

The studentship will comprise fees together with an annual stipend of £14,296 and will be awarded for a period of up to three years subject to satisfactory progress.

If you wish to discuss your proposal or receive advice on this project, please contact:

Professor Maurice Mulvenna, E: md.mulvenna@ulster.ac.uk, T: 028 90 368602

Procedure
For more information on applying go to ulster.ac.uk/research
Apply online ulster.ac.uk/applyonline

The closing date for receipt of completed applications is 24th February 2017

Interviews will be held in March 2017