TITLE OF POST: Post Doctoral Researcher - MACSI (x2 positions)

LOCATION: University of Limerick

REPORTS TO: Project Leader

CONTRACT TYPE: Specific Purpose

SALARY: €36,489 p.a.

JOB DESCRIPTION

QUALIFICATIONS:
- A doctoral degree (level 10 NFQ) completed in applied mathematics, mathematics, physics, computer science, or other relevant discipline

OVERALL PURPOSE OF THE JOB:

The Mathematics Applications Consortium for Science and Industry (MACSI) is Ireland's largest applied and industrial mathematics group and works closely with scientists and industrial companies across a wide variety of sectors. MACSI's aim is to foster new collaborative research, in particular on problems that arise in industry through the application of cutting-edge mathematical and modelling techniques.

The emerging discipline of Computational Social Science (CSS) studies human behaviour, as manifested in the digital trails we leave in our interactions with each other. The development of mathematical models for CSS is urgently required to underpin the analysis of large-scale data and to move beyond the identification of correlations to create new scientific understanding of collective behaviour in both online and offline social networks.

In this Science Foundation Ireland funded project, we are seeking to recruit two postdoctoral researchers to develop new mathematical techniques and models to help revolutionise the understanding of the dynamics of social spreading phenomena, such as viral information contagion and cascades of popularity. We will focus on the mathematics of age-dependent (non-Markovian) branching processes to generate analytical and asymptotic results for inference and calibration with large-scale CSS data. Understanding and controlling the temporal aspects of information diffusion and cascade dynamics on social networks will improve the predictability of technology adoption and opinion propagation and enable us to accurately identify the most influential nodes within diverse dynamical systems on complex networks. As part of the project, we will seek to develop and apply algorithms to social spreading phenomena that are of interest to industry partners.

The candidate should have a strong publication record in either or both of the following areas:
- Mathematics of networks.
- Analysis and model calibration using large-scale Computational Social Science data.

DESCRIPTION:
Research
- Contribute to the research programme of MACSI under general guidance of a Principal Investigator.
- Define research objectives and proposals for own (or joint) research in line with research strategy.

Research Management
- Plan, co-ordinate and implement research project (this may include managing a small research team/co-ordinating other researcher activity).

Income Generation/Funding
- May identify sources of funding and pursue the process of securing funds.
- May work with PI to contribute to proposals for developmental purposes.

Research Outputs - Write Up and Dissemination
- Write up results from own research activity.
- Contribute to the research project's dissemination, in whatever form (report, papers etc.)
- Present information on research progress and outcomes e.g. to funding bodies; conferences, steering groups; other team members, as agreed with the PI.
- Where appropriate, work with PI to register patents to protect intellectual property.

Supervision
- May act as co-supervisor or be a member of a supervision panel.
- May act as mentor to foreign students on undergraduate placement.

Essential Criteria
- A doctoral degree (level 10 NFQ) completed in applied mathematics, mathematics, physics, computer science, or other relevant discipline.
- Strong publication record in either or both of the following areas:
  - mathematics of networks.
  - analysis and model calibration using large-scale Computational Social Science data.
- High proficiency in the use of at least one high-level computing language (e.g., MATLAB, Python etc.).
- Well-developed ability to communicate technical concepts to non-experts.
- Ability to liaise and collaborate with other researchers in the University and with industrial partners.
- Excellent interpersonal and communication skills.

Desirable Criteria
- Experience in developing mathematical models for social spreading phenomena.
- Demonstrated strong organisational skills and ability to lead within a group.
- Evidence of participation in interdisciplinary research projects.
- Experience of Industrial Research & Development and awareness of the importance of Intellectual Property management and protection.

Further Information for Candidates:

Recruitment Procedures used at the University of Limerick (UL)
The University of Limerick is committed to the Open, Transparent and Merit-Based Recruitment (OTM-R) of Researchers as detailed in our Recruitment/Appointment Procedures for Research Staff.

The University of Limerick generally uses a three stage recruitment procedure: screening, shortlisting and interview.

Screening: Initially applications for an advertised position are screened to determine if applicants have met the 'Essential Criteria' as outlined in the advertised job description. Only candidates who meet the 'Essential Criteria' will progress beyond this stage.

Shortlisting: Depending on the number of applications remaining, it may not be possible to interview every candidate who has passed the screening process. Therefore, at this stage the Selection Board for this position may review the applications which have passed screening and will select a final shortlist of candidates who in their view were most closely aligned to the post as advertised.

Interview: Once a shortlist has been finalised, all applicants will be notified of the status of their application. The final shortlist of candidates will then be invited to interview. We aim to provide at least one week's notice to all candidates. The interview process may take the format of a standard interview and may also include a presentation

Job description

– if so, you will be provided with details of this in your invitation to interview letter. Candidates may interview in person or also via our Video Conferencing facilities.

General Recruitment Timelines
Please note that applications for all vacancies must be submitted online at www.ul.ie/hrvacancies in advance of 12 noon Irish Standard Time on the advertised closing date. We aim to complete the screening process within one week of the closing date, and the shortlisting process within a further week. Therefore we aim to be in touch with all candidates within one month of the closing date.

Please note these timelines may vary based on various factors including the number of applications received.

Benefits at the University of Limerick
Employees of the University of Limerick receive a variety of benefits including:
* Membership of the Single Public Service Pension Scheme.
* Membership of the Income Continuance Plan
* The opportunity to join the University's Additional Life Cover plan.
* Coverage in the UL Sick Leave Scheme.
* Flexible working practices such as the Shorter Working Year Scheme.
* Preferential rates for home, car, travel and health insurances.
* Employee wellness is a priority and a number of initiatives take place each year for the benefit of UL employees, see more at www.ul.ie/hr/be-well-ul.
* Preferential rates for access to the UL Arena swimming pool and fitness centre.
* Supported professional development under the Further Study Policy.

Equal opportunities at the University of Limerick
The University of Limerick is an equal opportunities employer, is committed to selection on merit and to the developing and maintaining a positive working environment, in which all employees are treated with dignity & respect. In pursuit of this, it is the policy of the University to provide all employees with an environment, which is free from bullying, harassment or victimisation of any form. You can read more about this in the University's Equality and Diversity Policy

The UL strategic plan Broadening Horizons 2015-2019 clearly states that UL seeks to exemplify gender equality best practice in all aspects of its activities, reinforcing UL's position as the leading university in Ireland in terms of female representation in senior academic roles, 31% of women in UL are at full professorial level, compared to the national average of 19%.

UL is the proud holder of the prestigious Bronze Institution Athena SWAN Award, the first university in Ireland with Trinity College, Dublin to achieve the award. The AS charter recognises higher education institutions, academic departments, and research institutes that put in place initiatives to address gender inequality, including initiatives aimed at changing culture and attitudes. The UL strategy explicitly commits the institution to the Athena SWAN process. Further details available on www.ul.ie/hr/athena-swan-ul.

Development opportunities at the University of Limerick
A key objective of the University's Strategic Plan 2015-2019 is to support staff development. In the context of this objective the University is committed to progressive development programmes and opportunities to enable all employees to fully develop their potential. Further information is available here. The University of Limerick is also has a 'Performance and Development Review System' which employees may avail of.

Additional Links:
Link to Human Resources:	www.ul.ie/hr/
Link to the University of Limerick's	Research Staff Role Profiles
Link to the University of Limerick's Strategic Plan;	'Broadening Horizons'

Job description