Marie Skłodowska-Curie EDGE Postdoc Fellowship at CONNECT research centre, Trinity College Dublin, Ireland

Research Topic: Investigation of Nonlinear Dynamics and Feedback Control of the Internet of Things - At the Crossroad of Complex Systems Science, Biology and Control Theory

Post summary

The EDGE programme targets experienced researchers seeking a prestigious career development fellowship. EDGE fellows will be researchers who are technically strong in their own discipline and capable of performing high-value, interdisciplinary research.

This fellowship will provide the successful candidate with the opportunity to work closely with Trinity College academics and the US Air Force Office of Scientific Research (AFOSR), benefiting from top class research, training and professional career development objectives.

Interested candidates should contact Prof Nicola Marchetti (nicola.marchetti@tcd.ie) sending a CV by **15 September 2017**, and if deemed eligible and suitably qualified to pursue the research topic, will be invited to apply for a 24 month fellowship, under the Marie Skłodowska-Curie COFUND 'EDGE' programme (http://edge-research.eu/). This application will require the candidate to submit their own research proposal considering the goals and research areas below, developed with the support of Prof. Marchetti's group, by 1st November 2017.

If successful, the researcher will work under the supervision of Prof Nicola Marchetti (https://nicolamarchetti.wordpress.com/) and Dr Irene Macaluso (https://www.scss.tcd.ie/Irene.Macaluso/).

The invited applicant will be in competition with others within the Marie Skłodowska-Curie EDGE program, to be awarded the fellowship only in case he/she passes the evaluation process (including peer review and interview). Successful applicants may start their Fellowships from February 2018.

The successful candidate will be encouraged to spend some of his/her time on a secondment in AFOSR Labs, to support his/her work and career development.

Research Goals

- Study of dynamical complex systems, drawing on concepts from complex systems science, biology and control theory, and using them to underpin a new approach to the time evolution analysis of wireless networks.
- Inform the tuning of adaptive and self-organizing Internet of Things (IoT) communication networks, providing guidelines to influence the network's emergent behaviour.

Research Areas

- Modelling of the nonlinear dynamics in IoT networks, including order-to-chaos transitions and Sensitive Dependence on Initial Conditions (SDIC), and their implications for the communication system's frame design in terms of feedback control.
- Structural controllability for topologies and dynamics of interest in the context of IoT networks/functions and its limits. Implications for redundancy and/or degeneracy of network functions and topologies.

Eligibility

Experienced researchers of any nationality and residing worldwide. For full eligibility criteria, please see http://edge-research.eu/application-process/eligibility-criteria/.

This fellowship is offered at one of two Levels with associated compensation, either level 1 (for candidates with less than 4 years post-PhD or equivalent) or level 2 (at least 4 years post-PhD or equivalent and less than 8 years).

Duration

24 months.

Salary

This MSCA Fellowship provides an annual salary comprising a living + mobility allowance of EUR 40,000 (Level 1) and EUR 51,700 (Level 2). Fellows with dependents will be entitled to an additional family allowance, annually EUR 5,400. All or part of these allowances may be subject to employee taxes and other deductions.

Desirable qualifications

- Strong background in software design for telecoms applications, networks, components (e.g., control plane, protocol implementation, PHY/MAC).
- Knowledge in control theory and dynamical systems theory.
- Familiarity with complex systems science.
- Established track record of publication in leading journals and/or conferences, in the area of wireless communications.
- Solid written and oral communications skills.
- The ability to work well in a group, and the ability to mentor junior researchers, such as Ph.D. students.

Information about CONNECT Research Centre

Trinity College Dublin is the leading university in Ireland ranked no. 88 in the world and no. 29 in Europe. CONNECT is Ireland's telecommunications research centre. We pride ourselves in carrying out research that is of the highest quality and that has international impact. We also pride ourselves in being an inclusive, diverse, creative, and friendly place to work.

CONNECT (https://connectcentre.ie/) is a Science Foundation Ireland (SFI) Research Centre headquartered in Trinity College Dublin, Ireland. Its mission is to research, develop and innovate new solutions to the many communications challenges facing society. New broadband architectures, new cellular technologies and the Internet of Things are at the centre of our work. CONNECT places special emphasis on the use of national testbeds to differentiate our work.