



Post Specification

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| Post Title: | Post-doc fellow in Self-Organising Radio Access Networks |
| Post Status: | 18 months contract |
| Funded by: | Science Foundation Ireland & Irish Research Council |
| Location: | Trinity College Dublin, School of Engineering and School of Computer Science & Statistics |
| Salary: | Commensurate with experience and achievement (salary scale range from new postdoc up to 3 years' experience) |
| Closing Date: | Until position filled |

Open position

6G networks will provide ultra-high performance and possibility of customisation, through an increasing number of heterogeneous and flexible access points. However, scale and flexibility will also increase complexity of resource management, so that self-organisation and autonomicity are becoming important requirements for networks, aiming to achieve in practice the paradigm of zero-touch network management.

One Post-doc fellowship is available for work in the **area of Self-Organising Radio Access Networks**. The position will involve the **development of intelligent algorithms for resource management in 6G mobile networks (including optical, wireless and cloud segments of the network)**, also based on machine learning algorithms. The aim is to optimise relevant metrics, such as capacity, latency, availability, quality of service and energy consumption, to satisfy requirements of future 6G networks.

The post will involve the study of how to inform the **tuning of adaptive and self-organizing communication networks, providing guidelines to influence the network's emergent behaviour**. To achieve the above, the candidate is expected to investigate dynamic topologies of interest (including implications of the concepts of redundancy and/or degeneracy) in the context of future networks/functions and their benefits/limits in terms of network performance indicators. A combination of physical and functional **topology graphs**, and of the **information theoretical measures defined based upon such graphs**, can be applied to understand and optimise the underlying mechanisms that lead to desired network properties (e.g., scalability, energy efficiency, latency) in modern communication networks.

The position will be based in the CONNECT research centre at Trinity College Dublin, Ireland and will be funded for **at least 18 months, but contract extension is possible based on mutual satisfaction**. The post-doctoral fellow will also be part of the School of Engineering and School of Computer Science and Statistics in TCD. **The position will be under the direction of Prof Nicola Marchetti and Prof Marco Ruffini.**



Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin



Qualifications

The candidate must have a PhD in Computer Science, Computer Engineering, Electronic Engineering, or a related field. Equivalent experience to a PhD will also be considered. The post is applicable to both new or more experienced PhD holders, and salary will be commensurate with experience and achievement. The successful candidate will join a team of highly skilled and innovative researchers in next generation wireless and optical networks.

Required Knowledge & Experience

- Interest in at least two of the following areas: self-organising networks, virtualisation and orchestration, AI/machine learning for networks, graph theory
- Strong background in software design for telecoms applications, networks, components (e.g., control plane, protocol implementation, PHY/MAC)
- Familiarity with complex systems science and/or self-organising networks
- Established track record of publication in leading journals and/or conferences, in the area of telecom theory and engineering
- The ability to work well in a group, and the ability to mentor junior researchers, such as PhD students
- Working knowledge of machine learning theory and algorithms
- Working knowledge of programming languages such as c++, java, python
- Excellent written and oral communication skills
- Strong self-motivation and willing to learn attitude

Post Funding

The post is funded by Science Foundation Ireland (SFI) and the Irish Research Council (IRC).

Post Location

The post will be hosted at the CONNECT (<https://connectcentre.ie/>) is Ireland's largest telecommunications research centre. The Centre carries out industry-informed research focusing on wireless and optical networks of the future with a strong emphasis on the technologies that will underpin these networks.

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.

Trinity College Dublin

Founded in 1592, Trinity College Dublin is the oldest university in Ireland and one of the older universities of Western Europe. On today's campus, state-of-the-art libraries, laboratories and IT facilities, stand alongside historic buildings on a city-centre 47-acre campus.

Trinity College Dublin offers a unique educational experience across a range of disciplines in the arts, humanities, engineering, science, human, social and health sciences. As Ireland's premier university, the



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pursuit of excellence through research and scholarship is at the heart of a Trinity education. TCD has an outstanding record of publications in high-impact journals, and a track record in winning research funding which is among the best in the country.

The Library of Trinity College is the largest research library in Ireland and is an invaluable resource to scholars. In addition to purchases and donations accrued over four centuries, the College has had 200 years of legal deposit. By this right Trinity can claim a copy of every book published in Ireland the UK. The Library has over 4.25 million books, 22,000 printed periodical titles and access to 60,000 e-journals and 250,000 e-books. The Library's research resources also include internationally significant holdings in manuscripts (the most famous being the Book of Kells), early printed material and maps. Its collections and services support the College's research and teaching community of 15,000+ students and academic staff.

Trinity continues to attract intellectually strong students from Ireland and abroad. The accessibility of a Trinity education to all students of ability is very important. Trinity College was the first university in Ireland to reserve 15% of first year undergraduate places for students from non-traditional learning groups – students with a disability, socio-economically disadvantaged students as well as mature students. There is also an exciting international mix of its student body where 16% of students are from outside Ireland and 40% of these students are from outside the European Union. Students also benefit from a scholar teacher model where they have the opportunity of being taught by world-leading experts in their field. Interdisciplinarity forms a key element in the College strategy in increasing Trinity's international standing as a research-led university.

Many of Trinity College Dublin's alumni have helped shape the history of Ireland and Western Europe. They include author, Jonathan Swift, philosopher, George Berkeley, political philosopher, Edmund Burke, wit and dramatist, Oscar Wilde, historian, William Lecky, religious scholar, James Ussher, scientists, John Joly, George Johnstone Stoney, William Rowan Hamilton and physicians, William Stokes and Denis Burkitt.

Four of Trinity College's alumni have won Nobel prizes, in Physics (1951), Literature (1968), Peace (1976), and Medicine (2015). The first President of Ireland, Douglas Hyde was a TCD graduate as was the first female President of Ireland, Mary Robinson.

Equal Opportunities Policy

Trinity College Dublin is an equal opportunities employer and is committed to the employment policies, procedures and practices which do not discriminate on grounds such as gender, civil status, family status, age, disability, race, religious belief, sexual orientation or membership of the travelling community.

Application Procedure



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SFI Research Centre for
Future Networks



Candidates should submit a cover letter together with a **curriculum vitae to include the names and contact details of 3 referees (along with their email addresses)** to:

nicola.marchetti@tcd.ie and marco.ruffini@tcd.ie

Prof Nicola Marchetti & Prof Marco Ruffini,
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