

**Discipline: Network Science**  
**Northeastern University London Fully Funded PhD Scholarship**

***Complex Networks, Temporal Dynamical Models and Adaptive Strategies: studying the interplay between human behaviour and spreading processes for disease prevention***

Northeastern University London > Network Science

Deadline: 19th of September 2024

Funded PhD Project (UK or International Students)

Funding provider: Northeastern University London (NU London)

Subject areas: Network Science, Complex Systems, Computational Epidemiology, Computational Social Sciences, Game Theory,

Project start date: October 2024/January 2025

Supervisors (\*lead):

- Andreia Sofia Teixeira\* (Network Science Institute, Northeastern University London)
- Esteban Moro (Network Science Institute Northeastern University)
- Mark Wass (University of Kent)

Aligned programme of study: PhD in Network Science

Mode of study: Full-time

**About the Network Science Institute (NetSI)**

In 2023, [NetSI established a new institute hub](#) in London, UK at Northeastern University London. The new NetSI in London was created to advance research, education, and innovation centred around network science. The hub in London will also facilitate the development and growth of collaborations and partnerships within the UK and across Europe and US. The London hub, along with others in the US, is part of the NetSI Global program which is dedicated to engaging and integrating regional network science communities and partnering with regional talent, institutions, ecosystems of innovation.

The PhD student, even though based in London, will be a member of the Network Science Institute (NetSI), which has offices in Boston MA, Portland MA, and London UK. NetSI,

founded in 2014, has emerged as a world leader of multidisciplinary research communities in the field of network science. NetSI brings together expertise from diverse disciplines, from the physical, information, and social sciences, with the goal to build and expand common, synthesising methodology and theory of networks, and to apply these tools to important societal challenges.

The successful doctoral student will be connected to NetSI's vibrant community, with dozens of externally funded research programs, diverse faculty, and a uniquely skilled pool of fellow doctoral students and postdoctoral researchers across the global network.

### **Northeastern University London**

As part of a major investment, Northeastern University London (NU London) has multiple, fully-funded PhD studentships available to accelerate its interdisciplinary research in the humanities, social sciences, and computing, maths, engineering and natural sciences. Each scholarship is fully-funded for three and a half years (UKRI rates) and includes full course fees, an annual stipend (including an additional London allowance) and associated costs, such as training.

NU London is both a UK university governed by UK higher education regulations, and the European campus of Northeastern University – a large, top-tier research intensive, Boston-based institution. Founded in 1898, Northeastern University is known for its high-impact research, aimed at solving problems across the globe. Interdisciplinarity, experiential learning, and connection to partners beyond academia are at the heart of the Northeastern University ethos. Northeastern received \$230.7m of external research funding in 2022, and is the recognized leader in experience-driven lifelong learning. It has campuses across the United States and Canada (in Boston; Charlotte, North Carolina; Portland, Maine; Oakland, California; San Francisco; Seattle; Silicon Valley; Arlington, Virginia; the Massachusetts communities of Burlington and Nahant; Toronto and Vancouver). Whilst the PhD will be a UK qualification, students will have the opportunity to engage with and visit the Northeastern University network overseas as part of their London-based doctoral studies, providing a truly unique and highly sought-after dimension to their research training.

### **The Project**

We are seeking a PhD candidate to investigate human interactions in the contexts of infectious disease spread and opinion dynamics. This research will explore and develop analytical tools to study emergent phenomena from individual actions and interactions, which are often unpredictable and challenging to model. The project aims to integrate network science, evolutionary game theory, and machine learning to analyse relationships within populations. Signed networks will capture both cooperative and antagonistic relationships, offering insights into how these connections affect behaviour and information flow. Evolutionary game theory will simulate decision-making processes in response to changing conditions, while machine learning will analyse large-scale network data, uncover hidden patterns, and address missing

data challenges. As part of the project we aim to develop a comprehensive framework with which the student will contribute to the understanding of how positive and negative relationships influence the spread of diseases, the formation and evolution of cooperation and opinions over time and across different scales, and also the coupling between both diffusion phenomena. Such processes will be analysed using datasets containing information regarding HIV-related risk behaviours, testing, and use of prevention services among populations highly vulnerable to the disease.

**The successful candidates will have:**

- Bachelor's degree (first/upper second or equivalent) in Complex Systems, Network Science, Data Science, Computational Social Science, Physics, Mathematics, Biomedical Engineering, Computer Science, or related subjects (essential).
- Proficiency in programming languages relevant to research, e.g., Python, R, SQL, Julia (essential).
- Fluency in English, both spoken and written (essential)
- Highly collaborative spirit, personal initiative, and genuine interest in interdisciplinary teamwork (essential).
- Excellent personal and good communication skills (essential).
- An inquiring mind and the desire to challenge themselves (essential).
- Enthusiasm for interdisciplinary applied research (essential).

The successful candidates will benefit from a brand new campus on the banks of the River Thames next to Tower Bridge. This is an interdisciplinary, vibrant research environment with international collaboration and networking opportunities and dedicated research space. It will form the hub of a highly experienced, multi-institution supervisory team from NU London, Northeastern University and the University of Kent. In addition, successful candidates will benefit from the unique connection to the wider Northeastern University network in North America, providing a range of additional research opportunities and learning resources.

Shortlisted candidates will be interviewed in September 2024. Candidates are welcome to contact the NU London supervisor with informal enquiries before the application deadline: [sofia.teixeira@nulondon.ac.uk](mailto:sofia.teixeira@nulondon.ac.uk)

**Eligibility**

- Bachelor's degree in a relevant subject - 2:1 or 1st (essential)
- Master's degree in a relevant subject (optional)

**English Language requirements:**

If applicable – IELTS 7 overall (with a score of at least 6.5 in each individual component) or equivalent.

### **Nationality**

Applications are open to UK and international students. Please indicate if you are likely to require a visa on your application. We are unable to support visa costs

### **Funding**

This scholarship covers the full cost of tuition fees, an annual stipend and an additional London allowance (set at UKRI rates) for 3.5 years. For the 2024/2025 academic year the annual stipend is £21,237. Annual increments will be in line with UKRI rates.

### **International travel**

Students will have the optional opportunity to travel to Northeastern University in North America to further their research training and experience.

### **How to Apply**

Please submit a CV and a Covering Letter stating how you meet the requirements and why you are interested in the proposed research project by clicking on [this link](#) by **23.50 on the 19<sup>th</sup> September 2024**. Please reference your application “**PHDCN0924**”