DEPARTMENT OF ELECTRONIC AND ELECTRICAL ENGINEERING

Fully-funded PhD studentship in 'Optical networks for the cloud': in collaboration with Microsoft Research

Duration of study: Full Time

Starting date: any time between June – September 2019

Application deadline: 29 March 2019 or until filled

Eligibility: UK/EU students ONLY

Applications are invited for PhD studentship, fully funded by Microsoft Research, to work in the Optical Networks Group (Head - Professor Polina Bayvel), Department of Electronic and Electrical Engineering, UCL) on designing optical networks topologies for the cloud.

The studentship covers Home/EU tuition fees and an annual stipend of £16,777 (2018-2019), increasing annually with inflation, together with a generous top-up of £3k per year. Additional support will cover consumables, books, professional memberships and travel to workshops and conferences, including to different Microsoft locations worldwide.

The studentship is funded for 3 years on a full-time basis, with a possibility of a funded 4th year.

Additional information: The student will work closely with researchers on the EPSRC TRANSNET (Transforming optical networks – building an intelligent optical infrastructure) programme grant: https://www.ucl.ac.uk/transnet-programme/, collaborating with researchers at Microsoft Research in Cambridge. This position is one of a dedicated of cohort of students who work on this programme under a series of research studentships, fully funded by industry and/or EPSRC. The Optical Networks Group at UCL has graduated a high number of very successful PhD graduates who have won a series of prizes and awards for their research, and are now working in leading academic and industrial research laboratories in the world.

Optical fibre networks underpin the digital communications infrastructure. The next research challenge is to introduce intelligence so that they able to dynamically provide capacity where and when it is needed – transforming next-generation information infrastructure. Cloud network traffic is expected to more than double every two years and new services require very low latency requirements. Research will focus on developing new approaches to the design of optical network topologies and architectures. Next-generation networks will need to be adaptive on different time- and

length- scales and be tailored to applications requirements on capacity and delay, physical properties of the nonlinear optical transmission channels, and the information from intelligent transceivers on network state. The research will combine techniques from graph theory, machine learning, digital communications and signal processing as well as high-speed optical transmission in the nonlinear regime. The aim is to experimentally demonstrate some of the proposed new schemes.

Eligibility: UK/EU students ONLY

The successful applicants will be part of the Optical Networks Group, Department of Electronic & Electrical Engineering. Applicants **(UK/EU only)** should be outstanding academically, ideally have 1st class (or a very good 2'1) undergraduate degree or equivalent in physics, communications or electronic & electrical engineering and a clear aptitude and enthusiasm for research. Understanding of graph theory, discrete mathematics and algorithms is desirable and competence/fluency with scientific computing is essential. It is likely that the research will include machine learning techniques to enable data-driven insights from physical experiments in optical networks. This aspect will require an understanding of data science and machine learning – where some exposure to machine learning libraries, like Tensorflow or similar, is an advantage. We would welcome candidate with strong skills in using the terminal environment in Linux or MacOS, and exposure to front-end tools in HPC or cloud computing. Experience of hands-on experimental work in a (optical communications/nonlinear optics/high-speed digital comms) research environment is also a significant advantage.

Applications should be made using the UCL postgraduate study application form and mark it to the attention of Polina Bayvel, Optical Networks Group.

http://www.ucl.ac.uk/prospective-students/graduate/apply

http://www.ucl.ac.uk/prospective-students/graduate/research/degrees/electronic-electrical-engineering-mphil-phd

Please contact Professor Polina Bayvel on p.bayvel@ucl.ac.uk for any further information and any questions of eligibility.

Closing date: 29 March 2019 – although we will continue to advertise until this studentship has been filled.