



Fully-funded PhD studentship in ‘Machine Learning (ML) for Ultra-Wideband Optical Fibre Transmission System’

A fully funded four-year PhD studentship is available to UK students/EU students who can meet the criteria as set out here:

<https://www.ucl.ac.uk/research-services/research-studentships/eu-and-overseas-students>

Duration of study: Full time - four years fixed term

Starting date: October 2019 (or as soon as possible)

Application deadline: 30th July 2019 (or until filled)

Primary Supervisor: Dr Lidia Galdino, University College London

Background: The Internet is formed by a huge global web of optical fibre, connecting cities and continents by crossing the oceans and transporting more than 99% of all internet traffic data. The growth of the “Internet of Things”, video services and social media means data traffic is growing at an ever-increasing rate. The world record capacity of 120 Tbit/s transmitted over a single mode fibre was experimentally demonstrated by the Optical Networks Group at UCL in partnership with Xtera communications.

The maximum information throughput in an optical fibre depends on transmission bandwidth and the signal-to-noise ratio, which defines the signal quality. Optical fibres have more than 50THz of available transmission bandwidth, defined by the low-loss wavelength region of glass, but only 20% of this potential has been explored by the researchers and commercial systems. This is mainly due to bandwidth restrictions imposed by the long-established erbium-doped fibre amplifier (EDFA).

The PhD project will investigate broadband optical amplifiers technologies and all optical components that operate across the entire 50THz of spectrum to support next generation of optical networks. Of particular focus and interest to be explored are; machine learning (ML) algorithms to mitigate nonlinear noise in semiconductor optical amplifiers SOA and Raman amplifiers used for signal amplification; and optical fibre modelling to predict the performance of ultra-wideband transmission systems.

Qualifications required: Candidates should have or expect to achieve an excellent degree(s) (BEng/MEng/MSc) in Electronic Engineering, Computer Science or related discipline. The research will include a mix of theoretical and experimental work, and the ideal candidate should have the following skills and knowledge

- Understanding of optical communications (desired)
- Experimental skill (desired)
- Scientific computer programming, e.g. MATLAB or Python (essential)

The PhD student will be part of the UCL's Optical Networks Group, a world-leading team working on the next generation of optical communication systems.

For more information, please visit:

ONG: <https://www.ucl.ac.uk/electronic-electrical-engineering/research/optical-networks>

The press release on 120 Tbit/s work can be downloaded here:

<https://www.xtera.com/wp-content/uploads/2018/12/91-nm-bandwidth-low-noise-amplifiers-enable.pdf>

Funding: This is a fully funded 4-year studentship available to **Home/UK students** covering tuition fees plus a tax-free stipend of £17,280 per annum (2019/2020 rates) for living costs (increasing with inflation).

EU students can also receive the full award funding provided they can meet the criteria as set out here: <https://www.ucl.ac.uk/research-services/research-studentships/eu-and-overseas-students>

How to apply: Applications must be made using the [UCL online application system](#) and indicate the name "**ONG/Galdino**".

Applications should include a CV and a cover letter. Please also provide the name and email addresses of two references.

Contact: For informal enquires please send a CV, including a list of any publications to Dr Lidia Galdino (l.galdino@ucl.ac.uk) who will be happy to answer any queries about the project.

UCL is committed to equality and values diversity.