DEPARTMENT OF ELECTRONIC AND ELECTRICAL ENGINEERING

PhD Studentship:
EPSRC Industrial CASE Award in Optical Communications
(UK or EU/Home students only)

Simplified Coherent Optical Access Networks

A fully-funded PhD studentship, covering research on transceiver design and digital signal processing (DSP) for optical communication systems, is available in the Department of Electronic and Electrical Engineering at University College London (UCL). The project will develop and test simplified communications systems which can be used in optical access networks.

Background: Optical fibres are the core communications medium which enables the Internet. The last decade saw a dramatic increase in the data rates transmitted over optical fibres, driven by the demand for video content, 4G connectivity, social media, and the related inter-data centre communications.

Access networks are the final few kilometres of optical fibres (or, more often, fibre and copper), which connect end users to the Internet. With the high data rate and low latency requirements of 5G networks, and the increased consumer and business demand for faster Internet connectivity, the current communications techniques used in these consumer-facing networks are unlikely to be capable of meeting demand.

In long-distance transmission systems, a technique known as coherent detection is used to overcome these limitations, however it is still too complex to be used in access networks. Therefore, the research in this project aims to understand the extent to which digital coherent transmission systems can be simplified, in terms of optical and digital requirements, whilst achieving ever-higher data rates.

Based within UCL’s Optical Networks Group (ONG), the state-of-the-art laboratory facilities include a recirculating loop test-bed, twelve 92 GSamples/s, 8-bit, digital-to-analogue converters, several ultra-wide bandwidth coherent receivers and real-time, digital oscilloscopes, state-of-the-art optical fibres, and access to a dark fibre, inter-university network (National Dark Fibre Infrastructure, NDFIS).

The research will include a mix of theoretical and experimental work, and so skills in, and enthusiasm for, one or more of the following areas is desirable:

- Laboratory-based research
- Scientific computer programming
- Digital signal processing/Algorithm design
PhD Studentship: In line with EPSRC eligibility conditions, the studentship is open to UK students and EU students who have been resident in the UK for at least 3 years. The studentship is funded through a Doctoral Training Partnership CASE award and is available for 4 years, with a start date between September and December 2019.

The award includes tuition fees and a tax-free stipend which is currently £17,280 per annum (or pro rata if taken part-time) which can be topped up to £20,000 per annum, depending on experience. Candidates holding, or expecting to receive, a first class or 2.1 honours degree (or equivalent), in Engineering, Mathematics, Physics, Computer Science, or a related scientific discipline are encouraged to apply.

UCL is committed to equality and values diversity, and selection for this programme of study will be based on merit. However, please note that funding restrictions do limit eligibility, as noted above.

Applications should be made through the UCL postgraduate study application form and indicate the name “ONG/Lavery”.

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

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

The application must be submitted with a CV, a cover letter (describing how your profile, knowledge and skills will suit the project), and contact details for two referees.

Please contact Dr Domaniç Lavery (d.lavery@ucl.ac.uk) for any further information and any questions of eligibility.

Closing Date: Applications will be considered on a rolling basis until the end of Autumn 2019, and the position will be advertised until it is filled.