

## Deep Learning for Jointly Modelling Text and Image Representations

Applications are invited for a 4-year PhD studentship in the **School of Engineering & Applied Science** (<http://www1.aston.ac.uk/eas/>), Aston University, Birmingham, UK

**4-Year Studentship:** This studentship will pay tuition fees and a tax-free stipend of **£15,500 per annum** (increases on an annual basis), for a period of **4 years**.

**Start Date:** 1<sup>st</sup> October 2015 (or later by agreement).

**Background:** Deep learning has gained significant interest in recent years due to ground breaking results in various areas including natural language processing, computer vision and speech recognition. Deep learning approaches employ many-layered neural networks that automatically learn hidden semantic structures at different levels of abstraction from the raw data such as text, images, video and audio signals. This approach opens the theoretical possibility to learn representations of data from different modalities, for example, text and images, and map them into the same semantic space. Typical applications include automatic generation of text descriptions of images, or retrieving images using natural language queries.

**Project:** Existing approaches to learning representations of multimodality data typically adopt a two-step process by first learning vector representations from each modality separately, and then proceeding to learn a mapping from one modality representation to another. Such approaches ignore the subtle relations between words/phrases and visual features. This PhD project aims to investigate a deep learning approach to jointly modelling text and image representations. In addition, adaptive learning of deep neural networks with the arrival of new data will also be investigated.

**Academic Requirements:** Applicants should have a first or upper second-class honours undergraduate degree or a relevant Masters Degree or equivalent experience in Computer Science, Mathematics, Statistics or a related discipline. Knowledge of machine learning, natural language processing or computer vision would be desirable.

**For informal enquiries:** Contact Dr Yulan He (email: [y.he9@aston.ac.uk](mailto:y.he9@aston.ac.uk), web: <https://sites.google.com/site/yulanhe8/>) or Dr George Vogiatzis (email: [g.vogiatzis@aston.ac.uk](mailto:g.vogiatzis@aston.ac.uk), web: <http://george-vogiatzis.org>).

**How to Apply:** Applications should be made online at <http://www1.aston.ac.uk/eas/research/prospective-research-students/how-to-apply/>. Please enclose a research proposal (a maximum of 2,000 words), and a full CV, giving contact details for two academic referees. Applicants from non-English speaking countries will require an IELTS score of 6.5, TOEFL score of 600 or equivalent.