Supervisor Name: Dr Caswell Barry & Dr Lewis Griffin
Supervisor Email: caswell.barry@ucl.ac.uk l.griffin@cs.ucl.ac.uk
Project Description: " Neuroscience and Artificial Intelligence"

The Studentship
This 4-year studentship is funded by EPSRC and is open to UK applicants. The PhD training and research will be carried out within CoMPLEX, UCL's Centre for Computation, Mathematics and Physics in the Life Sciences and Experimental Biology (http://www.ucl.ac.uk/complex) supervised jointly by Caswell Barry (Cell & Developmental Biology, UCL) and Lewis Griffin (Computer Science, UCL) with secondary supervision provided by Dr Charles Blundell (Deepmind & Gatsby, UCL).

The Project
The last five years have seen huge advances in the capability of machine learning - particularly deep learning and deep reinforcement learning (RL) - approaches that have in part been informed by our increased understanding of the brain. In turn these tools provide a powerful means to explore how information is processed in the brain - for example, understanding how sensory data is represented and transformed in biological networks or exploring what elements of observed neural activity predict forthcoming behaviours. Going further, it appears that deep networks can function as models of the brain and hence be useful for generating and testing neuroscientific hypotheses. For example, predicting how the brain might be expected to encode information about the movement of an animal through space (e.g. https://www.nature.com/articles/s41586-018-0102-6). Now, this increasingly mature field of NeuroAI provides a number of exciting opportunities for future research.

This project will draw on Caswell and Lewis' expertise in Neuroscience, Computer Science and Machine Learning with additional support provided by Charles Blundell of DeepMind. Specifically, you will be enrolled on the CoMPLEX 4-year PhD programme, the first year consisting of taught elements and practical classes combined with a number of lab rotations chosen from the range of CoMPLEX supervisors. During this time, in conjunction with Caswell, Lewis and Charles, you will define the precise NeuroAI topic on which you will work for the remaining 3 years. It is expected this work will be related to the supervisors existing research streams.

Beyond this you will be provided with opportunities to collaborate with leading experimental and theoretical groups within UCL's world-class neuroscience and computer science communities, providing the opportunity to develop, refine, and test machine learning based models of the brain.

The Candidate
The successful applicant should have or expect to achieve at least a 2.1 honours or equivalent for undergraduate degree in Maths, Physics, Engineering, Computer Science or Neuroscience. They should have a set of skills and interests that leave them well placed to exploit the increasingly important interface between Neuroscience and Computer Science. They will demonstrate strong interest and self-motivation in the subject, good computational and mathematical skills, as well as an ability to think analytically and creatively. Good presentation and writing skills in English are required. Previous research experience in contributing to a collaborative interdisciplinary research environment, in particular machine learning, is desirable but not necessary as training will be provided.

Please contact Caswell Barry and Lewis Griffin (caswell.barry@ucl.ac.uk & l.griffin@cs.ucl.ac.uk) for further details or to express an interest.

Applications will be accepted until 12PM on 14th September 2018 but the position will be filled as soon as an appropriate candidate is found