

Fully Funded 4-year Doctoral Studentship

Joint with **Satellite Application Catapult** and **DEIMOS** and the EPSRC CDT in **Autonomous Intelligent Machines & Systems (AIMS)**

Note: This studentship is fully-funded for Home/ROI students, and partially funded for Overseas students.

Supervisor(s): Professor Mike Osborne and Professor Yarin Gal

Start Date: October 2021

Autonomous systems powered by artificial intelligence will have a transformative impact on economy, industry and society as a whole. Our mission is to train cohorts with both theoretical, practical and systems skills in autonomous systems - comprising machine learning, robotics, sensor systems and verification- and a deep understanding of the cross-disciplinary requirements of these domains. Industrial partnerships have been and will continue to be at the heart of AIMS, shaping its training and ensuring the delivery of Oxford's world-leading research in autonomous systems to a wide variety of sectors, including smart health, transport, finance, energy and extreme environments. Given the broad importance of autonomous systems, AIMS provides training on the ethical, governance, economic and societal implications of autonomous systems. For more information regarding the AIMS programme, see our web pages at: aims.robots.ox.ac.uk.

One of the growing themes within AIMS is the investigation of autonomous systems in the context of space sector and Earth Observation in particular. This field of activity has drastically changed over the last 5 years, from a traditional computer vision approach involving a lot of remote sensing humans/experts to an automated information extraction approach towards decision making. The first reason being, that satellite (and drone) imagery availability has increased for a single place on Earth from a few images a month to multiple images (even video) per day or hour. In addition, considering that just 10% of the optical imagery is usable (day light and no clouds) and a very few details actually change from one day to another, there is no point to download Peta Bytes of data every day to the ground segment while the useful information extraction could be done on board of the satellite. In order to achieve this revolution, Artificial Intelligence is used to develop more complex and near real-time applications which can potentially be put on-board of platforms like satellites or High-Altitude Platform Stations: detection of illegal logging, counting cars in supermarkets, detecting ships, monitoring environmental threats, monitoring crops and diseases...).

If you are interested in this area, please apply for a fully/partially funded scholarship within AIMS in collaboration with Satellite Application Catapult and Deimos Space UK. The Satellite Applications Catapult is an innovation centre focused on the exploration of new ideas to support the space sector. Deimos Space UK is a key European actor in space sector: space exploration, GNSS, Earth Observation, Space Awareness, Launchers. The successful candidate will have the opportunity to address emerging problems in the areas of Earth Observation using new approaches related to Neural Networks. Following the breakthrough with Convolutional Neural Networks, Deimos, Satellite Applications Catapult and the University of Oxford are looking at integrating a-priori knowledge into the neural network architecture. This will help to develop a new generation of smarter Neural Network that will provide new services/applications to the citizens using satellite data.

Award Value

The studentship covers the full course fees (Home) plus a stipend (tax-free maintenance grant) of £15,285 p.a. for the first year, and at least this amount for a further three years.

Eligibility

This studentship is available to all applicants.

Prospective candidates will be judged according to how well they meet the following criteria:

- Applicants are normally expected to be predicted or have achieved a first-class or strong upper second-class undergraduate degree with honours (or equivalent international qualifications), as a minimum, in computer science, engineering, physics, mathematics, statistics or other related disciplines. A previous master's qualification is not required.
- Excellent English written and spoken communication skills

Candidates will also need to demonstrate a broad interest in some or all of the four AIMS themes:

- robotics & vision
- machine learning
- control and verification
- cyber-physical systems

The deadline for applying is Friday 22nd January 2021. Candidates are therefore recommended to apply as soon as possible to and to inform wendy.adams@eng.ox.ac.uk when they have done so.

If you have any technical questions about the DPhil Studentship, please email wendy.adams@eng.ox.ac.uk

Please quote **AIMS-SAC-DS-2021** in the studentship reference box.

There are other sources of funding through the CDT associated with Industry, and all applicants will be considered for these.

aims.robots.ox.ac.uk