Fully Funded Doctoral Studentship on AI and Semantic Technology in collaboration with Bosch

DPhil in Computer Science

Department of Computer Science, University of Oxford

Supervisor: Professor Ian Horrocks

The Department of Computer Science at the University of Oxford is currently looking for an outstanding candidate to fill a fully funded doctoral studentship position in the Data and Knowledge Research Group led by Professor Ian Horrocks.

The aim of the project is to perform fundamental research on the topic of combining sub-symbolic AI and Semantic Technology in domains where it has proved challenging to apply purely sub-symbolic techniques, for example in domains where expert knowledge plays a critical role.

This Studentship Project Description: Combining Sub-symbolic AI and Semantic Technology

It has proved challenging to apply purely sub-symbolic AI techniques (such as machine learning) in domains such as biomedicine, finance, law and manufacturing where expert knowledge plays a critical role. In such cases, combining AI and Semantic Technology promises to overcome many of the limitations of sub-symbolic AI by exploiting domain knowledge captured in so-called knowledge graphs. However, many challenges remain both with respect to creating suitable knowledge graphs, integrating them with sub-symbolic AI and applying the results in relevant domains.

This project will address these challenges, motivated by use cases from manufacturing and quality control. In particular, we aim to address problems related to the (semi-) automation of knowledge graph construction and curation. Preliminary investigations suggest that this could be achieved by using state-of-the-art machine learning techniques (such as deep neural networks and semantic embedding) to help extract and integrate the semantics of structured and semi-structured resources such as tabular data, knowledge graphs and ontologies.

The project is a collaboration with Bosch research in Germany, who will contribute realistic use-cases and considerable research expertise in the area, as well as a significant supplement to the usual student stipend. The successful applicant will be expected to collaborate with and spend several weeks per year visiting the Bosch research group in Stuttgart.

The successful candidate will join a world leading research group with expertise in both the theory and practice of semantic technologies, as recently recognised by best paper awards at the International Joint Conference on Artificial Intelligence (IJCAI), and the International Conference on the Semantic Web (ISWC), and Test of Time awards at the International Conference on Knowledge Representation (KR) and the International Conference on Automated Deduction (CADE). The group also has strong ties with industry, with ongoing

projects funded by eBay, Samsung Research and Siemens, and a spin-out company (Oxford Semantic Technologies) successfully commercialising the group's RDFox Knowledge Graph system (https://www.oxfordsemantic.tech/). See http://www.cs.ox.ac.uk/isg/krr for more information about the research group and our various research projects.

The project will provide an enhanced stipend to the student of at least £27,000 per annum for at least 3 1/2 years (42 months). The project will also cover the cost of course fees at the level set for either Home students or Overseas students (as applicable), travel, and provision of a laptop computer.

Applicants must satisfy the usual requirements for studying for a doctorate at Oxford. Candidates must also have good writing, communication and presentation skills (see the University's web pages on the DPhil in Computer Science for details). Existing experience in AI and/or semantic technology is desirable but not essential.

You should apply online by Friday 7 January 2022, quoting studentship reference 22-CS-IH

Informal enquires are encouraged and should be addressed to Professor Ian Horrocks (ian.horrocks@cs.ox.ac.uk). See also http://www.cs.ox.ac.uk/ian.horrocks/.

For further information about the studentship or the application process please e-mail Computer Science Graduate Admissions.