



**WORKING
TOGETHER ON
BIG DATA AND
THE INTERNET
OF THINGS**

COMPUTER
SCIENCE



ROYAL
HOLLOWAY
UNIVERSITY
OF LONDON

WORKING WITH OUR STUDENTS

PLACEMENTS

All our degrees (undergraduate and postgraduate) include a one-year placement. Hosting a placement student is an opportunity to add highly motivated members to your teams and to determine if they would make suitable long-term hires. In the case of postgraduate placements, it is also an excellent opportunity to benefit from more mature and highly qualified

students and to 'test the waters' before deciding on the adoption of new methods or technologies.

International students will not require additional work visas because placements are an integral part of their degrees. Only students with good academic performance will be allowed to go on a placement.

PROJECTS

All students have to do an individual project supervised by an academic member of staff. Companies and organisations are welcome to propose projects that contain enough academic content for the learning outcomes of the degree to be met.

There are three types of projects:

- > Bachelors – approximately 300 hours between October and March
- > Integrated Masters – approximately 600 hours between October and March
- > Masters – approximately 600 hours between June and August

WORKING WITH OUR EXPERTS

MODES OF COLLABORATION

Collaborations can take a variety of forms which include: technical consultancy, sometimes supported by postgraduate placements; co-funding of PhD students to work on topics that are integral to a business's mid-term plans; Knowledge Transfer Partnerships, and other opportunities to leverage government/EU funding

for strategic technology developments in Big Data and the Internet of Things.

We can provide bespoke training allowing companies to get up to speed on cutting-edge technologies; company staff can also register for MSc programmes taught in a part-time block mode suitable for day release.

SOME COLLABORATION EXAMPLES

- > Automated target identification (with QinetiQ)
- > Fault diagnosis (with Marconi Instruments/FRI)
- > Biomarker discovery (with CIPHERGEN Biosystems)
- > Anomaly detection (with Thales UK)
- > Missing values and imputation (with the Office for National Statistics)
- > Abdominal pain treatment (with Western General Hospital, Edinburgh)
- > Analysis of smart meter data (with British Gas)
- > Space mission operations (with NASA)
- > Large-scale distributed infrastructures (with Facebook, IBM and British Gas)

DEGREES

BACHELORS (BSc) AND INTEGRATED MASTERS (MSci) PROGRAMMES

- > Computer Science
- > Artificial Intelligence
- > Distributed and Networked Systems
- > Information Security
- > Software Engineering

MASTERS (MSc)

- > Computational Finance
- > Data Science and Analytics
- > Distributed and Networked Systems
- > Machine Learning
- > The Internet of Things

TAUGHT CORE MODULES

BIG DATA

- > Data Analysis (including supervised learning and Bayesian methods)
- > Business Intelligence Systems, Infrastructures and Technologies
- > Large-scale Data Storage and Processing (including Hadoop, Pig, and MongoDB)
- > Machine Learning (including linear and kernel methods)
- > Methods of Computational Finance
- > On-line Machine Learning (including predictions or decisions in real time)
- > Programming for Data Analysis (MATLAB)

- > Semantic Web (including semantic markup languages)
- > Visualisation and Exploratory Analysis

INTERNET OF THINGS

- > Advanced Distributed Systems
- > Intelligent Agents and Multi-agent Systems
- > Interconnected Devices (based on Arduino)
- > Smart Cards, RFIDs and Embedded Systems Security
- > Wireless, Sensor and Actuator Networks

RESEARCH

ALGORITHMS

Constraint satisfaction problems; graphs and combinatorics; parameterised, polynomial, exact, approximation and heuristic algorithms; combinatorial optimisation; access control; development and analysis of algorithms for improving the effectiveness of industrial processes.

ARTIFICIAL INTELLIGENCE

Cognitive and autonomous agents, multi-agent platforms; automated planning, scheduling and search; applications in surveillance operations, disaster response, space operations, assistive technology, e-health, connected communities, business continuity, and games.

BIOINFORMATICS

Development and application of statistical modeling and machine learning for systems biology and medicine; analysis of large scale transcriptomics and proteomics data; network medicine; network pharmacology.

DISTRIBUTED AND NETWORKED SYSTEMS

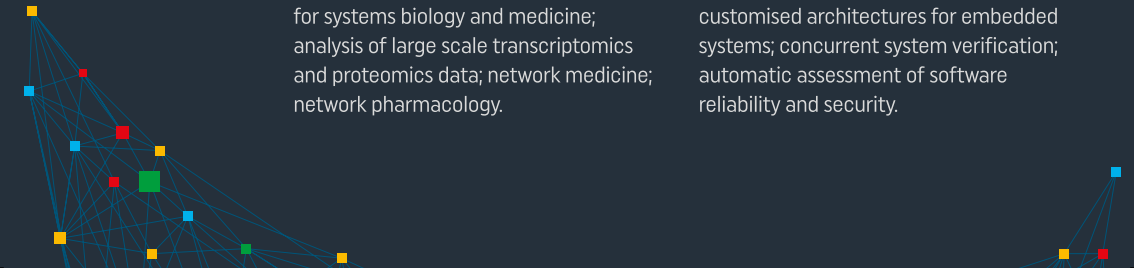
All aspects of distributed computing and systems including design and analysis of algorithms, large-scale and cloud-based systems, fault-tolerance, and concurrent data structures for multi-core computing.

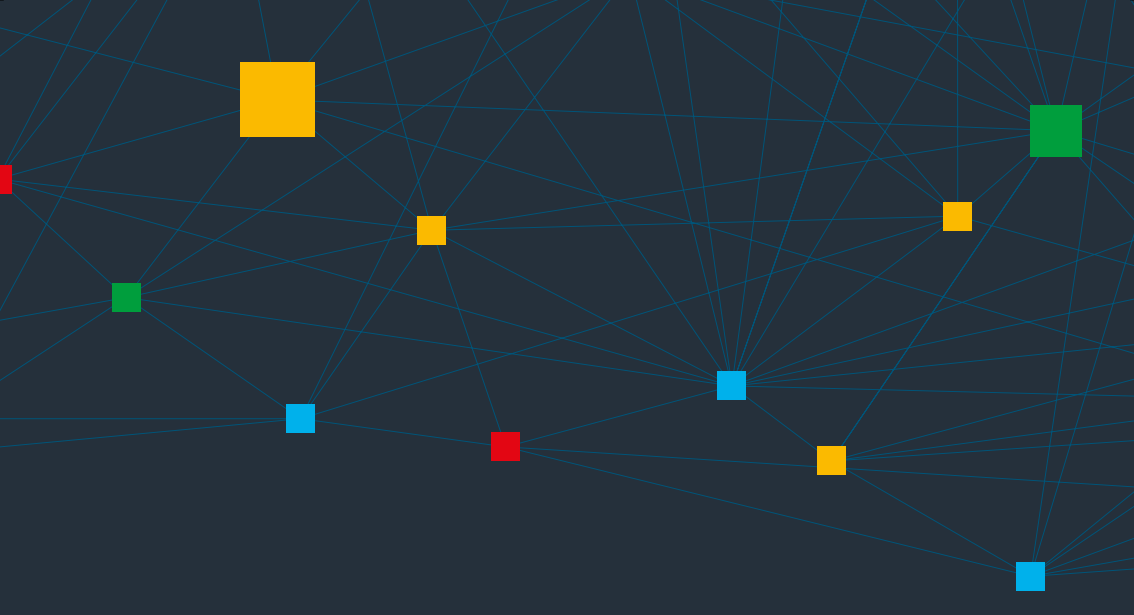
MACHINE LEARNING

High-dimensional data analysis, kernel methods for regression and pattern recognition, Bayesian inference and belief networks; competitive learning; conformal prediction; reinforcement learning and learning in sequential decision problems; evolutionary optimisation methods.

SOFTWARE LANGUAGE ENGINEERING

Programming language design and implementation; generalised parsing; domain-specific language development; reverse compilation; derivation of customised architectures for embedded systems; concurrent system verification; automatic assessment of software reliability and security.





Royal Holloway is a research-intensive university, ranked 19th in the UK and 129th in the world by the Times Higher Education World University Rankings for 2015-2016, where it is described as 'truly world class'.

Computer Science is an elite department ranked 11th in the UK for the quality of our research output in the latest Research Excellence Framework (2014). We have a broad network of industrial and government collaborators.

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