COMPUTATIONAL STATISTICS AND MACHINE LEARNING MRes / 2019/20 ENTRY

www.ucl.ac.uk/graduate/
There is a high demand from industry worldwide, including from substantial sectors in the UK, for graduates with skills at the interface of traditional statistics and machine learning. MRes graduates benefit from the department's excellent links in finding employment; this programme is also ideal preparation for a research career.

The programme aims to provide graduates with the foundational principles and the practical experience needed by employers in the areas of computational statistics and machine learning (CSML). Students will have the opportunity to develop their skills by tackling problems related to industrial needs or to leading-edge research. They also undertake a nine-month research project which enables the department to more fully assess their research potential.

The Centre for Computational Statistics and Machine Learning (CSML) is a major European Centre for machine learning, having co-ordinated the PASCAL European Network of Excellence which represents the largest network of machine learning researchers in Europe.

UCL Computer Science graduates are particularly valued by the world's leading organisations in internet technology, finance, and related information areas, as a result of the department's strong international reputation and ideal location close to the City of London.

The programme is delivered through a combination of lectures, tutorials and seminars. Lectures are often supported by laboratory work with assistance from demonstrators. Students liaise with their academic or industrial supervisor to choose a study area of mutual interest for the research project. Performance is assessed by unseen written examinations, coursework and the research dissertation.

### Degree summary

The programme aims to provide graduates with the foundational principles and the practical experience needed by employers in the areas of computational statistics and machine learning (CSML). Students will have the opportunity to develop their skills by tackling problems related to industrial needs or to leading-edge research. They also undertake a nine-month research project which enables the department to more fully assess their research potential.

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### Degree structure

**Mode:** Full-time: 1 year

**Location:** London, Bloomsbury

Students undertake modules to the value of 180 credits. The programme consists of one core module (15 credits), four optional modules (60 credits) and a dissertation (105 credits).

Please note that the list of modules given here is indicative. This information is published a long time in advance of enrolment and module content and availability is subject to change.

#### COMPULSORY MODULES

- Investigating Research (15 credits)

#### OPTIONAL MODULES

Student select four modules from the following:

- Advanced Deep Learning and Reinforcement Learning (15 credits)
- Advanced Topics in Machine Learning (15 credits)
- Applied Bayesian Methods (15 credits)
- Approximate Inference and Learning in Probabilistic Models (15 credits)
- Graphical Models (15 credits)
- Information Retrieval and Data Mining (15 credits)
- Introduction to Deep Learning (15 credits)
- Introduction to Machine Learning (15 credits)
- Inverse Problems in Imaging (15 credits)
- Machine Vision (15 credits)
- Probabilistic and Unsupervised Learning (15 credits)
- Researcher Professional Development (15 credits)
- Selected Topics in Statistics (15 credits)
- Statistical Computing (15 credits)

#### DISSERTATION/REPORT

- All students undertake an independent research project which culminates in a substantial dissertation (105 credits).
Your career

Graduates have gone on to further study at, for example, the Universities of Cambridge, Helsinki, and Chicago, as well as at UCL. Similarly, CSML graduates now work in companies in Germany, Iceland, France and the US in large-scale data analysis. The finance sector is also particularly interested in CSML graduates.

Employability

Scientific experiments and companies now routinely generate vast databases, and machine learning and statistical methodologies are core to their analysis. There is a considerable shortfall in the number of qualified graduates in this area internationally, while in London there are many companies looking to understand their customers better who have hired CSML graduates. Computational statistics and machine learning skills are in particular demand in areas including finance, banking, insurance, retail, e-commerce, pharmaceuticals, and computer security. CSML graduates have obtained PhD positions both in machine learning and related large-scale data analysis, and across the sciences.
Entry requirements

A minimum of an upper second-class UK Bachelor’s degree in a highly quantitative subject, or an overseas qualification of an equivalent standard. We require candidates to have studied a significant mathematics and/or statistics component as part of their first degree, and students should also have some experience with a programming language, such as MATLAB.

English language proficiency level

If your education has not been conducted in the English language, you will be expected to demonstrate evidence of an adequate level of English proficiency.

The level of English language proficiency for this programme is: Good.

Information about the evidence required, acceptable qualifications and test providers is provided at:
www.ucl.ac.uk/graduate/english-requirements

Your application

Students are advised to apply as early as possible due to competition for places. Those applying for scholarship funding (particularly overseas applicants) should take note of application deadlines.

When we assess your application we would like to learn:

- why you want to study Computational Statistics and Machine Learning at graduate level
- why you want to study Computational Statistics and Machine Learning at UCL
- what particularly attracts you to this programme
- how your academic and professional background meets the demands of this programme
- what mathematics and statistics experience you have
- what programming experience you have
- where you would like to go professionally with your degree.

We also ask that students attach a formal research proposal with their application.

On your application, please state the name of an academic that you wish to supervise your MRes project.

Together with essential academic requirements, the personal statement is your opportunity to illustrate whether your reasons for applying to this programme match what the programme will deliver.

FEES AND FUNDING 2019/20 ENTRY

<table>
<thead>
<tr>
<th>Status</th>
<th>Tuition Fee (FT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU</td>
<td>£13,340</td>
</tr>
<tr>
<td>Overseas</td>
<td>£28,410</td>
</tr>
</tbody>
</table>

The tuition fees shown are for the year indicated above. Fees for subsequent years may increase or otherwise vary. Further information on fee status, fee increases and the fee schedule can be viewed on the UCL Students website.

All full-time students are required to pay a fee deposit of £2,000 for this programme. All part-time students are required to pay a fee deposit of £1,000.

Full details of funding opportunities can be found on the UCL Scholarships website: www.ucl.ac.uk/scholarships

APPLICATION DEADLINE

All applicants: 14 June 2019

Details on how to apply are available on the website at:
www.ucl.ac.uk/graduate/apply

CONTACT

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EU referendum

For up-to-date information relating to specific key questions following the UK’s decision to leave the EU, please refer to www.ucl.ac.uk/brexit