Machine Learning for Domain Specialists (COMP0142)

**Description**

**Aims:**
Introduce the students to the basics of machine learning while giving class-based examples of applications to areas of domain specialisation.

**Learning outcomes:**
On successful completion of the module a student will be able to: understand elements of the fundamental concepts and mathematical basis of machine learning; apply practical machine learning software in order to perform data analysis tasks.

**Content:**
General theory and mathematical foundations are presented in lectures while practical applications are presented in classes.
The module includes:

- An introduction to machine learning tasks (unsupervised, supervised, reinforcement);
- Mathematical foundations (linear algebra, calculus, probability, statistics);
- Supervised Learning: including an exploration of some of the following: linear and polynomial regression, logistic regression, Naive Bayes, kernel methods, SVMs, decision trees, ensemble learning, neural networks, Gaussian processes;
- Unsupervised Learning: including an exploration of some of the following: PCA, manifold learning, k-means, Gaussian mixture models, EM algorithm.

**Requisites:**
In order to be eligible to select this module, a student must be registered on a programme for which it is a formally-approved option or elective choice AND should have experience of rudimentary programming and an awareness of standard results in fundamentals of linear algebra (vectors, matrices, eigenvectors /eigenvalues etc.),

**Key information**

<table>
<thead>
<tr>
<th>Year</th>
<th>2019/20</th>
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<tr>
<td>Credit value</td>
<td>15 (150 study hours)</td>
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<tr>
<td>Delivery</td>
<td>UG L6, Campus-based</td>
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<td>Reading List</td>
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<tr>
<td>Tutor</td>
<td>Mr Dariush Hosseini</td>
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<tr>
<td>Term</td>
<td>Term 2</td>
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<td>Timetable</td>
<td>View on UCL website</td>
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</table>

**Assessment**

| Written examination (departmentally managed): 30% |
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| Coursework: 20% |
| Coursework: 20% |

**Find out more**

For more information about the department, programmes, relevant open days and to browse other modules, visit ucl.ac.uk
elements of probability theory (random variables, expectation, variance, conditional probabilities, Bayes rule etc.), elements of statistics (sample statistics, maximum likelihood estimation etc.), and calculus (real-valued functions, derivatives, Taylor series, integrals etc.). Results from these areas will be used, often without proof, throughout the module.

**Self-Assessment Test:**
Students should take the self-test available here, to assess their ability for this module.
Computer Science

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Disclaimer: All information correct as of August 2019. Please note that aspects of the module may be subject to change. UCL will make best efforts to inform applicants of major changes.
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