

## Spatial-Temporal Data Analysis and Data Mining (STDM) (CEGE0042)

### Description

#### Outline:

This module introduces advanced theories and techniques to visualise, predict, cluster and simulate (big) spatio-temporal data.

Students will be introduced to the topics of statistical modelling, data mining and machine learning, and will learn tools and techniques for spatio-temporal analysis, with an emphasis on application to real world problems such as transport, crime, health, natural hazards and social media analysis;

#### *The module content covers six topics:*

- 1.Exploratory spatio-temporal visualisation;
  - 2.Statistical modelling and forecasting (Spatio-Temporal Auto-Regressive Integrated Moving Average);
  - 3.Space-time clustering and outlier detection;
  - 4.Machine learning techniques (Kernel-based analysis, Support Vector Machines, Random Forests, and Artificial Neural Networks);
  - 5.Space-time multi-agent simulation;
  - 6.Text mining and Social media analysis;
- Lectures are supported by practical sessions, where real data (temperature, journey time, GPS, crime and tweets) are used to demonstrate the techniques, with applications in environment, transport, crime and social media analysis.

The software packages used are R (<http://www.r-project.org/>), SaTScan (<http://www.satscan.org/>) and NetLogo (<https://ccl.northwestern.edu/netlogo/>).

The course is suitable for MSc students in GIS, Geospatial Analysis, Spatio-Temporal Analytics, Computer Science and related subjects;

### Key information

<b>Year</b>	2018/19
<b>Credit value</b>	15 (150 study hours)
<b>Delivery</b>	PGT L7, Campus-based
<b>Reading List</b>	<a href="#">View on UCL website</a>
<b>Tutor</b>	<a href="#">Prof Tao Cheng</a>
<b>Term</b>	Term 2
<b>Timetable</b>	<a href="#">View on UCL website</a>

### Assessment

■ Group coursework: 100%

### Find out more

For more information about the department, programmes, relevant open days and to browse other modules, visit [ucl.ac.uk](http://ucl.ac.uk)

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