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

Description
This module introduces advanced theories and techniques to visualise, model and analyse (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, business and natural hazards. 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, Artificial Neural Networks and Deep Learning) 5. Space-time multi-agent simulation 6. Social media analysis. Lectures are supported by practical sessions, where real data is 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, Smart Cities, Computer Science and related subjects.

Key information
- **Year**: 2019/20
- **Credit value**: 15 (150 study hours)
- **Delivery**: PGT L7, Campus-based
- **Reading List**: [View on UCL website](#)
- **Tutor**: Prof Tao Cheng
- **Term**: Term 2
- **Timetable**: [View on UCL website](#)

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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Disclaimer: All information correct as of December 2018. Please note that aspects of the module may be subject to change. UCL will make best efforts to inform applicants of major changes.