Complex Networks and Web (COMP0123)

Description

Aims:
This module introduces essential concepts and methods in the interdisciplinary research area of network science, with a particular focus on the Internet, the World Wide Web and online social media networks. Topics covered include topological properties and metrics of complex networks, mathematical models of networks, evolution of Internet topology, structures of the Web, network community detection, epidemic spreading models, analysis of social media networks, temporal networks, spatial networks, signed networks and network controllability.

Learning outcomes:
On successful completion of the module, a student will be able to:
1. Define and calculate essential network metrics;
2. Describe the structure of the Internet and the Web;
3. Relate graphic properties to network functions;
4. Explore new angles to understand network collective behaviours;
5. Design and conduct analysis on large networks;

Content:
- Complex networks;
- Network graphic properties;
- Random networks;
- Small-world networks;
- Scale-free networks;
- Generative network models;
- Rich-club coefficient;
- Network mixing patterns;
- Network structural constraints;
- Network centrality;
- Internet topology and models;
- The Web structure;
- Network visualisation;
- Network community structure;
- Epidemic spreading models;
- Network controllability;

Key information

Year 2019/20
Credit value 15 (150 study hours)
Delivery PGT L7, Campus-based
Reading List View on UCL website
Tutor Dr Shi Zhou
Term Term 1
Timetable View on UCL website

Assessment

Find out more

For more information about the department, programmes, relevant open days and to browse other modules, visit ucl.ac.uk

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.
- Document networks;
- PageRank;
- Temporal networks;
- Spatial networks;
- Signed networks;
- Twitter botnets;
- Online social network analysis;

**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 must have a strong competency in programming.
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