Complex Graph Networks

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En bref

- **Code Ametys:** N9EN22A
- **Ouvert aux étudiants en échange:** Oui

Présentation

Description

A First Course in Network Theory

One cannot ignore the networks we are part of, that surround us in every day life. There's our network of family and friends; the transport network; the banking network---it doesn't take much effort to come up with dozens of examples. Network theory aims to provide a mathematical framework for analysis of the huge networks that drive the global economy (directly or indirectly) and this course provides an introduction to the key tools and an opportunity to employ them to gain new insight into complex behaviours and structures in real-world data. This course will highlight the intimate connection between matrix algebra and graph theory and students will use this connection to develop a practical approach to analysing networks. MATLAB provides an ideal computational environment for large-scale simulation and analysis, in particular for identifying the key members of a network and for uncovering local and global structure that can be hidden by the scale of the data. Topics to be studied include: introduction to networks; spectral graph theory and the network Laplacian; random network models and degree distributions; network fragments; node centrality; global properties of networks; community detection.

Key words : networks, network fragments, node centrality, community detection.