



UNIVERSITÀ DEGLI STUDI DI TORINO

ID

TIC17_DIP_INF

Visiting Professor Program Academic year 2021/2022

DEPARTMENT OF COMPUTER SCIENCE

TEACHING COMMITMENT: 16 hours

COURSE TITLE

Complex Networks Analysis and Visualization

TEACHING PERIOD

2nd term

SCIENTIFIC AREA

Computer Science

LANGUAGE USED TO TEACH

English

The Degree Course is entirely taught in English

COURSE SUMMARY

Complex Networks and "Network Analysis"

- Introduction to complex networks
- Graph Theory and network metrics
- Centralities, small worlds, hubs
- Directed and weighted networks
- Network models
- Communities
- Strong and Weak Ties
- Structural Holes, Betweenness and Graph Partitioning
- Networks and Homophily
- A Spatial Model of Segregation
- Positive and Negative Relationships

- The Structure of the Web
- Link Analysis, PageRank, and HITS
- Spectral Analysis, Random Walks and Web Search
- Power Laws and Rich-Get-Richer Phenomena
- Long Tail and Analysis of Rich-Get-Richer Processes
- Game Theory
- Small World and Search
- Traffic Networks
- Information Cascades
- Network Effects
- Epidemics
- Cascading Behavior in Networks

LEARNING OBJECTIVES

The course introduces the fundamental concepts, principles and methods in the interdisciplinary field of network science.

Topics covered include mathematical models of networks, common networks topologies, structure of large scale graphs, community structures, epidemic spreading, centrality measures. A relevant part of this teaching will focus on dynamical processes in networks, i.e., epidemic spreadings over contact networks, diffusion of ideas, opinions, and so on.

Additionally, students will utilize Gephi, D3, Python, networkx and matplotlib, and many other tools to execute many of these techniques on existing datasets.

TUTORSHIP ACTIVITIES

N/A

LAB ACTIVITIES

N/A

OTHER ACTIVITIES BESIDES THE COURSE

N/A

VISITING PROFESSOR PROFILE

We are looking for candidates with the following profile.

Research:

We are looking for senior scientists with more than 10 years of experience after PhD with a strong background on computational social science, social media analytics, collective intelligence, informetrics, and digital libraries. The ideal candidate has a demonstrated record of independently designing and conducting research and publishing results in competitive conferences and journals.

The candidate must also have a documented record of funded projects where she/he worked in as a PI or co-PI.

Teaching :

The candidate must have teaching experience, at both graduate and undergraduate levels.

CONTACT PERSON AT THE DEPARTMENT

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