



## ***Teach Mob – Visiting Professors***

### ***Academic year 2017/2018***

2 <sup>nd</sup> term
<b>COURSE TITLE</b> Analysis and Visualization of Complex Networks
<b>Scientific area</b> Computer Science
<b>Department of Computer Science</b>
<b>Language used to teach</b> Italian and English
<b>Teaching Commitment: 90 hours (70: Ruffo, 20: visiting professor)</b>
<b>Course summary</b> This module introduces the fundamental concepts, principles and methods in the interdisciplinary field of network science, with a particular focus on analysis techniques, modelling, and applications for the World Wide Web and online social media.  Topics covered include graphic structures of networks, mathematical models of networks, common networks topologies, structure of large-scale graphs, community structures, epidemic spreading, PageRank and other centrality measures, dynamic processes in networks, graphs visualization.  Another learning objective of this class falls in the field of scientific data visualization (quite differently w.r.t. MFN0954-"Complex Network"). Students will learn basic visualization design and evaluation principles, and learn how to acquire, parse, and analyse large datasets. Students will also learn techniques for visualizing multivariate, temporal, text-based, geospatial, hierarchical, and (above all) network/graph-based data. Additionally, students will utilize Gephi, D3, R and ggplot2 (with a brief introduction to Processing), and many other tools to prototype many of these techniques on existing datasets.
<b>Learning objectives</b> Basics of data and network science; Overview (with practical skills) of network analysis tools; Social media and web mining skills; Understanding of fundamental models in complex science to get causal relationships between data-driven phenomena; Visualization tools for complex data and networks
<b>Lab activities</b> Experiments and exercises will require both theoretical (mathematical models) and practical (network analysis and visualization) tools
<b>Other activities besides the course: i.e. seminars and conferences addressed to PhD students and research fellows, dissemination conferences</b> Other invited seminars (often in English) are usually offered to students. In previous editions of this

class, the following researchers have been invited to give talks about their ongoing projects:

Ciro Cattuto (ISI Foundation)

Daniela Paolotti (ISI Foundation)

Corrado Gioannini (ISI Foundation)

Mario Giacobini (Department of Veterinary, University of Turin)

Alessandro Flammini (Indiana University)

Santo Fortunato (Then: Aalto University, now: Indiana University)

Johan Bollen (TeachMob visiting, professor in 2016 - Indiana University)

### **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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