

The background of the slide is a light gray network of interconnected nodes and lines, resembling a social network or a data graph. The nodes are represented by circles of varying sizes, and the lines are thin gray lines connecting them. The overall pattern is dense and covers the entire background.

# Metodi e applicazioni per social network

# Generalità del corso

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## Orario:

Lunedì	Aula Beta	Via Comelico	9.00 – 11.30
Mercoledì	Aula beta	Via Comelico	11.30 – 13.30
Giovedì	Aula beta	Via Comelico	13.45 – 15.30
Venerdì	Aula Delta	Via Comelico	9.00-12.30

# Metodi e applicazioni per social network

**The Guardian: social media isn't just about collecting  
Facebook "likes" any more, says Danny Bradbury.**

**The smart money is  
extracting **intelligence** from the **network**.**

# Social media ROI


... Businesses are using the power of social media to gain a better understanding of their markets, customers and competition. However, they need **deep analytics** expertise to transform this “Big Data” into **actionable insights**.... [Source: IBM]

... There is a worrisome disconnect between marketers jumping into social media and their ability to effectively **measure** their success. In a recent 2012 industry report, 86 percent of marketers agreed that social media was important for their business and this trend is here to last, with 46 percent of business leaders planning to increase their social media budgets in 2014 by buying ads on Facebook or advertorials on groups of blogs. Yet, a recent Adobe report mentioned that only 12 percent of marketers feel capable of measuring **social media ROI** ... [Source: Forbes]

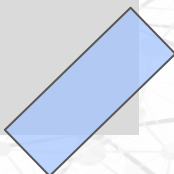
The background of the slide is a light gray network of interconnected nodes and lines. A blue arrow with a white outline points downwards from the top-left corner of the text box.

***Social Media Mining*** is the process of representing, analyzing, and extracting meaningful patterns from social media data

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*Researchers in this emerging field are expected to have knowledge in different areas, such as data mining, machine learning, text mining, **social network analysis**, and information retrieval, and are often required to consult research papers to learn the state of the art of social media mining.*



# Social media manager and analyst

Oggi l'errore più nefasto in cui può incorrere un professionista della comunicazione è considerare la rete come un luogo virtuale o peggio come l'ennesimo canale attraverso il quale "spingere" messaggi predefiniti. Al contrario la rete è un ecosistema, un territorio, fatto di spazi di relazione in cui portatori di interessi discutono, si organizzano, esigono risposte. Ma prima di dare risposte indistinte e preconfezionate, che potrebbero rivelarsi inadeguate quando non dannose, le aziende dovrebbero fermarsi a comprendere e studiare il groviglio di relazioni tra stakeholder che si sviluppano online...

**Una tecnica che può essere usata efficacemente per studiare e visualizzare l'ecosistema nel quale si volesse entrare, senza alterarne gli equilibri e ottenere un effetto negativo, è quella della [Social Network Analysis](#).**

**Il definitiva il ruolo del relatore pubblico al tempo della rete richiede lo sviluppo di nuove capacità non solo relazionali, ma anche di analisi di dati sociali.**

# Social network analysis

Wasserman-Faust:

«...Focus on relationships among social entities, and on the patterns and implications of these relationships....»

...The fundamental difference between a social network explanation and a non-network explanation of a process is the inclusion of concepts and information on relationships among units in a study...

...The network perspective differs in fundamental ways from standard social and behavioral science ... Rather than focusing on attributes of autonomous individual units, the social network perspective views characteristics of the social units as arising out of structural or relational processes or focuses on properties of the relational systems themselves...

...Relational ties among actors are primary and attributes of actors are secondary...»

Invention: sociogram (Moreno 1953)

Beyond Google Insights, Facebook analytics, ...



# Programma del corso

## Teoria

- Graph essential
  - Rappresentazione di grafi
  - Tipi di grafo
  - Sottografi, diadi e triadi
  - Cammini
  - Grafi connessi e componenti
  - Algoritmi su grafi
- Misure di popolarità e centralità
  - Degree
  - Betweenness, closeness, ...
- Random networks e scale free network
- Diadi:
  - Link strength: weak e strong
  - Link reciprocity
  - Link transitivity and balance
- Triadi:
  - Clustering coefficient
  - Common neighbours
  - Link prediction
- Small world network
- Clique and community detection
- Applicazioni
  - Information diffusion
  - Influence e homophily
  - Recommendation

## Laboratorio

- Tool di analisi e visualizzazione di reti
  - NetworkX
  - Gephi
- Network datasets
- Algoritmo di Dijkstra e Dijkstra troncato
- All-shortest-paths algorithm
- Connected component algorithm
- Centrality analysis
- Pagerank
- Twitter API
- Link analysis
- Triangle counting algorithm
- Common neighbours finding
- Applicazione: link prediction and recommendation
- Maximal clique finding
- Louvain community detection algorithm
- Label propagation algorithm
- Applicazioni

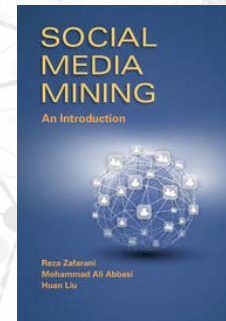
# Bibliografia e materiale

Reza Zafarani, Mohammad Ali Abbasi, Huan Liu

*Social Media Mining: An Introduction*

A Textbook by Cambridge University Press

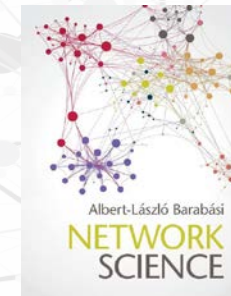
<http://www.cambridge.org/ca/academic/subjects/computer-science/knowledge-management-databases-and-data-mining/social-media-mining-introduction> [<http://dmml.asu.edu/smm/>]



Albert-László Barabási

*Network Science*

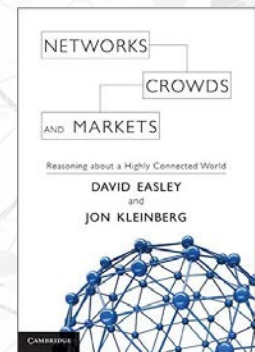
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D. Easley, J. Kleinberg

*Networks, Crowds, and Markets: Reasoning About a Highly Connected World*

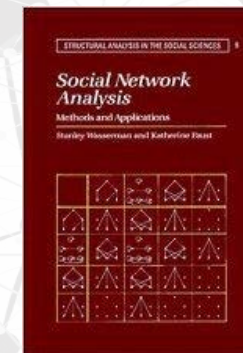
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Wasserman, Stanley and Katherine Faust. 1994.

*Social Network Analysis: Methods and Applications.*

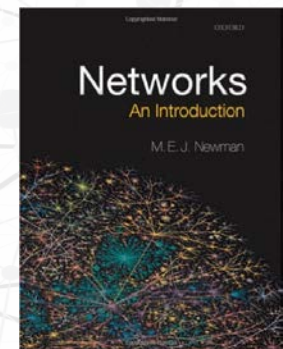
Cambridge: Cambridge University Press.



Newman, M.E.J.

*Networks: An Introduction.*

Oxford University Press. 2010.



**Scritto:** Domande aperte di teoria + esercizi

**Laboratorio:** Progetto individuale

una settimana prima dello scritto consegnare:

1. Notebook
2. Relazione scritta secondo le linee-guida che trovate sul sito del corso
3. Presentazione

**Orale:** Presentazione del progetto + domande