An Economist's view of Web Science

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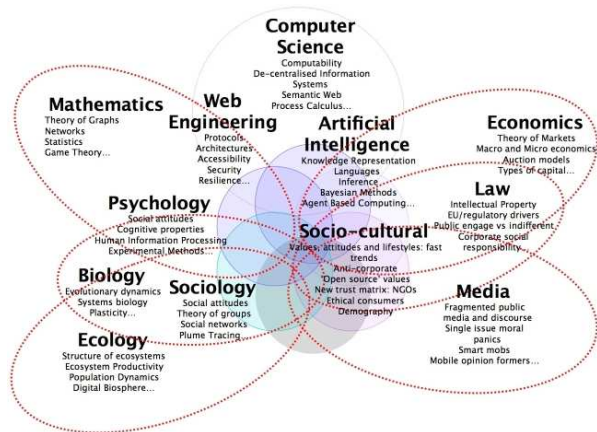
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- Computer Science, Economics, Law, Management, Maths, Sociology . . .

Someone else's picture

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- Competitive markets are efficient (but not fair)
- Quantitative framework for positive and normative analysis

Economics or computer science?

- Information and search
- Peer production and social computing
- Online markets: e-bay v. Yahoo; Google's click auction, ...
- Platforms and two-sided markets
- Incentives in distributed systems

Example: economics and networks

Some characteristics of networks

	WWW	Citations	Co-author	Ham Radio	Prison	High School Romance
Number of Nodes	325,729	396	81,217	44	67	572
Randomness	0.5	0.62	3.5	5.0	590	1000
Avg. Degree	4.5	5	1.7	3.5	2.7	0.84
Avg. Clustering	0.11	0.07	0.16	0.06	0.001	0

Table: Characteristics of different social networks

How an economist would think about this

- An individual gets a benefit of b from each direct link
- Gets a benefit of b^2 from each 'friend of a friend'
- Forming links is costly $c \geq 0$
- 5 individuals who are considering whether to form links

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- What networks will form?
- Depends on b and c

Efficiency

- c very low: "complete" network
- c moderate: star
- c very large: empty network

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- Inefficiency arises because of "free riding"
  - I prefer someone else to incur link cost
  - but everyone thinks like that
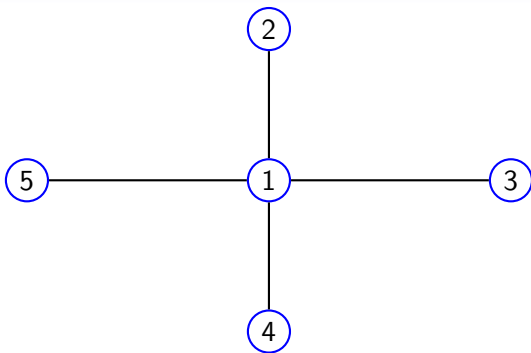 - too few links created
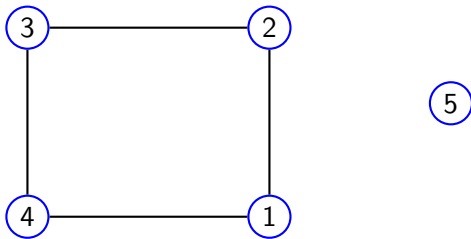
Figure: The star network

Figure: An equilibrium network with moderate costs

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- Implication 4: potential reasons for public policy

Some open questions

- How to measure and model the dynamics of networks?
- How to measure the value of user-generated content?
- Using online data to test models of network formation
- Role for policy in online networks
    - connectivity
    - ownership of data
    - subsidization