What is in this class? Should you take it?

A. Chaintreau
Columbia University

Lecture 0 – Wednesday, September 4th 2013
“The **economist** studies how you make choices …
The **sociologist** studies how your choices have already been made.”

D. Watts

Who wants you not to take this class?
Who are they?

- The economists
  aka Ostrom, Shapley …
- What do they like?
  - Rational players, Games
  - Axioms, Symmetry, Maths
  - Increasingly, computing
- How about institutions?
  - Ideally, a minimum, “laissez faire”
  - towards efficiency and fairness
Who are they?

- The sociologists aka Martineau, Durkheim, Granovetter
- What do they like?
  - Observations
  - Asymmetry, and what explains it
- How about institutions?
  - The main exogenous factor,
  - At most, suggest a reform
Consequences

- Working on economics of social networks used to be becoming an academic outlaw
  - Economists would disapprove your assumptions and results for sake of elegance
  - Sociologists would disapprove your methods and simplification, for lack of nuance

- But we are neither and we passed this point, … Did we?
3 Reasons why it’s true
What shapes public opinion?
mass media?

opinion leaders?

everybody?

1900-1950

Two-step flow

Viral, Cascades

1950-1980

1990-2000
2010s and why it changed it all

- Wide-scale adoption of new tools
  - Social sharing: Blogs, Micro-blogs,
  - Personalization: aggregator, news readers

- First large scale data sets “available”
  - Importance of media [An et al. 2011, Cha 2012]
  - Intermediaries exist [Wu et al. 2011]
  - Other descriptive works …
First reason to take this class

Economics, the science of making choice
... just realized we don’t make choices alone
... as soon as there was data to prove it.

- Our neighbors affect our own choice
  - Maybe because that’s all the signal we have
  - Maybe for a rational reason

In this class, Part I is how to model and analyze these dynamics
What shapes price?
“Any customer can have a car painted any colour that he wants so long as it is black.” H. Ford

Supply-demand
1900-1960

Act on demand
Differentiation
1960-2010

WSJ, 12/24/12

 Discrimination
2010-…

"Any customer can have a car painted any colour that he wants so long as it is black." H. Ford
Second reason to take this class

Markets, prices, and the economy
... runs on constrained added value
... many from advantageous position in a graph

- Model of exchanges where
  - customers have limited access to vendors
  - consumptions is socially induced

In this class, Part II deals with graphical economies, how to price them efficiently
What is a data-economy?
What makes a strong brand?

- Yesterday
- Today

Et la marmotte ...

A strong message, appealing to all!

Data about you, Nudge you in participating
Third reason to take this class

- If it’s free, you are the product being sold … whether you provide useful information, labor or simply marketing value

- A flurry of participative schemes (crowd-x)
  - With monetary reward (labor marketplace)
  - With indirect reward (credit, content, curation)

In this class, Part III surveys how to leverage customer data and participation
Objective of this class
Objectives of this class

- Become a full-research-citizen on economic aspects of social networks and applications
  - Demonstrate familiarity with important concepts
  - Know about fundamental proof techniques
  - Quickly grasp recent top-notch theory works (ACM EC, ACM WWW, Econ jnal, …)

- Benefit for your research
  - CS skills are on high-demand on these topics
Why NOT take this class?
3 ways to fail (for sure) in this class

1. If you are not ready! Prerequisites are
   - **Probability**: discrete, continuous, stoc. Process
   - **Linear Algebra**: eigenvalue, spectrum
   - **Optimization**: convex, Lagrange’s multiplier
   - **Elementary Graph** theory, **Game** Theory

2. If you just want ideas for your start-up
   - Theoretical depth over practical relevance

3. If you want a mature class and a top GPA
   - Emphasis on topics still hot for research
Warning: why this class is hard

- There is no textbook
  - I’ll refer to survey, books and important articles

- The terminology we inherit is atrocious

- The related work is dispersed
  - Economic theory, Econometrics, Marketing
  - CS Theory, CS domain application, ML
How to succeed in the class
How to enjoy (and maybe pass) it?

- Come and participate to the lecture
- Office hours: as close to course as possible
  - Thursday 8-9:30am, CEPSR 610

- Grading: finalized with enrollment
  - A few assignments (3?)
  - 1 midterm (no documents allowed)
  - Goal: Half lecture / Half presentations
More about the class

- All slides online (publicly) at http://social-networks-economics.wikischolars.columbia.edu

- Piazza
  - Read *before* you post
  - 24h policy

- Integrity rules to sign
- The “apple” policy
What’s upcoming
Roadmap

- Part I - Influence and Opinion dynamics
  - Spread, Consensus, Manipulation, Polarization
- Part II – Graphical economies
  - Macroscopic approach
  - Microscopic approach
- Part III - Applications
  - Crowdsourcing, incentives
  - Economy of personal data
What this class does NOT cover

- Not by lack of interest, but lack of time …
- Economics of networked infrastructure,
- Auctions, Mechanism Designs
- Prediction markets, Bayesian Learning

- These are strong hole. However, we may touch upon those topics as appropriate.
A bit about myself

- Worked first as undergrads in 1999 in Bay area
- Involved in ACM SIGCOMM, WWW, WSDM
- Studied at ENS-INRIA in Paris (Ph.D in 2006)
  - Interns at Sprint, Alcatel, IBM, Intel
  - Worked 5 years for Technicolor (formerly Thomson)
- Works on Mobile and Social Networks
  - Previously: multicast, TCP congestion control, p2p
  - Emphasis on performance of networked algorithm