1 Course Objective

Networks appear across modern life. Networks can influence the jobs people get, the products they buy, how they vote, and who they end up dating. Networks are intimately related to the internet and internet commerce, ranging from how web pages are linked, to who follows who on Instagram, to how viral marketers attempt to spread information about a product. Given how pervasive social and economic networks are to our lives it is important to understand which kind of networks are likely to appear (network formation) and how networks might influence behaviour (networks games). This course will begin with an overview of how networks impact economic behaviour and then examine the empirical properties of networks that we see in the world. After that we move to discussing models of networks formation. Finally we will study how networks impact behaviour like the spread of disease, how individuals in society learn from one another, why some products succeed while others fail, etc.

2 Teaching Assistant

Shufei Wang, swangbh@ust.hk

3 Prerequisites

ECON 5130 (MSc Micro)

4 Required Readings


2. Lecture Slides will be posted on Canvas

5 Reference Books on Reserve in Library

6 Course Intended Learning Outcomes

Upon completion of this course, you will be able to:

1. Understand more of the role that networks play in the modern hyper-connected world.

2. Provide insight into why we see certain phenomena, for example why social networks have short average path lengths.

3. Model social interactions using networks and strategic games, use game theoretic concepts to predict behaviour in these interactions, and be able to analyse ways in which altering the network and/or strategic game might affect outcomes.

7 Course Requirement and Evaluation

- Evaluation will be based on attendance (10%), problem sets (30%), and a final exam (60%).
- If you miss three or more classes without permission, your final grade will be F.
- Problem sets will be handed out each week. Solutions are due at the beginning of class the following week. Late submissions will not be accepted.
- The weekly problem sets may be solved in groups (of 3 or less), but each student must write up and hand up their own solutions. If you are working in groups you must write on the cover page of your solutions who you worked with.
- The final exam will be in class during the final lecture **March 27, 2018 (Tuesday)**, 14:30 - 16:30 (2 hours). The final exam contains all material covered throughout the semester. In the case of absence at an exam due to medical reasons, the student is required to submit a medical certificate issued by a registered medical practitioner. Appropriate documentation will be required for absences due to other reasons.
- Announcements, lecture slides, and supplementary materials (if any) will be updated onto the course website on Canvas. If a student finds difficulties in the course and has any concern about the course, it is to his/her benefit to contact me or the teaching assistant at the early stage.
- Extra office hours will be arranged for the week before the final exam.
- There is no lecture on Tuesday February 20, due to Chinese New Year.

8 Course Outline (tentative, subject to change.)

- Part 1: Background and Fundamentals
  
  Definitions and Characteristics of Networks (1, 2)
Empirical Background (3)

- Part 2: Network Formation
  - Random Network Models (4, 5)
  - Strategic Network Formation models (6, 11)

- Part 3: Networks and Behaviour
  - Diffusion and Learning (7, 8)
  - Games on Networks (9)

- Part 4: Study of two famous Applications
  - Original Google search engine (flavour of a citation model)
  - Blockchain & Bitcoin (hopefully a guest speaker)

9 Academic Integrity Policy

Honesty and Integrity is a central value in HKUST. Please be aware of the importance and maintain high standard of honesty in the problem sets and examinations in this course. Familiarize yourself to the university rules and the HKUST academic honor code by visiting following website: http://www.ust.hk/vpaaio/integrity/.