ISOM 5640
Social Media and Network Analysis
Spring , 2021
Department of Information Systems,
Business Statistics and Operation Management
(Preliminary Draft)

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Class meets:

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Course Description

Prerequisite: You need to have a good knowledge in python programming.

Main Contents: This course is about how to reach a conclusion from unstructured data in social media. We will discuss theoretical concepts and methods of networks and statistical analysis, build models with python, identifying linkage pattern, topics, opinions about topics, sentiment of opinions.

- download data from social media,
- preprocess text and unstructured data,
- detect topics and trends,
- identify opinions of users,
- evaluate sentiment score of users' comments.

Objectives: -
- Identify important community in social network
- Identify leaders in community
- Find popular topics in social community or news
- Detect trends with dynamic topic models
- Identify main opinions and their sentiment level for popular topics

Outcomes: -
- Import raw data from local data files or internet, preprocess data and get summary statistics and visualize data with python
- Be familiar with analytical methods and modesl for social media.
- Be able to explain the results of analytic models.

Course Materials

A. Lecture notes and codes in jupyter notebook

B. All topics and assigned projects require the installation of python package "Anaconda".

C. A course website (http://canvas.ust.hk) is maintained which contains lectures notes, assignments, and links of videos and data.

Evaluation

Your overall grade will be based on the following:

A. One group project(15%):group size ≤ 1.

B. One individual Project(25%):

C. In-class participation (10%)

D. Final(50%): The final must be done independently. You can refer to notes, books and internet, but are forbidden to communicate with other humans or AIs.

D. Standards for Assessment:

$A+, A, A-$	Excellent Performance
$B+, B$	Good Performance
$B-, C+, C$	Marginal Performance
F	Failure

Course Organization

- **Part I: Network Analysis of Social Media**

    - Lecture 1 - Basics of Network
        * Visualize network
        * Structure of Graphs
        * Random Graph Model
    - Lecture 2 -Identify important node
        * Centrality measure
        * PageRank
        * Influence Maximization
        * Customer Referral in Social Media
        * Persuasion
    - Lecture 3 -Identify important community
        * Community Structure
        * Community Detection
        * Density of community
        * Cascading behavior
    - Lecture 4 -Statistical Learning in social network
        * Prediction of link
        * Graph representation learning
        * Outbreak detection
        * Node classification
        * Bayesian learning in social netowkr
    - Lecture 5 -New Business in Social Media
        * Social Media Marketing
        * Rating and referal
        * Competitive Pricing

- **Part III: Content Analysis of Social Media**

    - Lecture 6 - Opinion and sentiment analysis
        * Motivation and application scenarios
        * Supervised approaches
        * Unsupervised approaches
        * Product review
        * Stock market prediction using news

- Lecture 7 - Topic Detection and Tracking
  * Statistics of topic models
  * Case I: Detection of topics in comments
  * Case II: Trend analysis

- **Part III: Final**

  - Lecture 8- in-class final

Grievance Procedure

If you disagree with grades that have been assigned to your work, you have the possibility to meet instructors within one week after the grades have been published on the course website. Be specific about what it is that you don't agree with.

Academic Integrity

Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating of information facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of other groups, or tampering with the academic work of other groups. All exam answers must be your own, and you must not provide any assistance to other students during exams.