香港浸會大學
HONG KONG BAPTIST UNIVERSITY

JOUR7280
Big Data Analytics for Media and Communication

Instructor: Dr. Xiaoyi Fu

https://github.com/shary777/JOUR7280

Contact Information

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- Time
  - MON 09:30-12:20
- Venue
  - CVA703

Course Objective

- To introduce the fundamental knowledge and hands-on skills of big data analytics in the field of media and communication
- This course works on different types of (online) data
  - How to fetch data.
  - How to analyze, interpret, and visualize data.

- This course (may) be hard…
- This course is interdisciplinary
- This course is informative and helpful!

Course Overview

Unit	Content	Week
Unit 1	Data science fundamentals and preliminary Python programming	Week 1-4
Unit 2	Automated web data collection	Week 5-8
Unit 3	Data (pre-)processing and data management	Week 8-10
Unit 4	Data exploration	Week 10-12

Assessment Components

Type of Assessment	Weighting	Description of Assessment Tasks
Class participation & tutorial tasks	15%	Students will be introduced in lectures and guided readings to the key concepts and methods on data acquisition and processing in the digital age.
Individual exercises	25%	Students develop and test customized algorithms individually to collect and process social media data.
Group project and presentation	60%	Students work in teams to collect, process, and analyze social media data and present their findings in data product and an oral presentation.

Assessment

- **Individual Exercises** (25%)
  - 1 automated online data acquisition challenge
  - 1 automated data processing (data cleaning) challenge
  - For each assignment:
    - 500– 800 words in English;
    - defining the problems
    - identifying the (online) data sources
    - presenting the codes and analytical process step by step
    - briefly reporting the results

Assessment

- **Group Project** (60%): Presentation (30%) and report (30%)
  - 3 - 4 students per group;
  - Develop a data-driven investigation and storytelling project based on first-hand automated web data collection and present the research questions, methods and approaches, and findings;
  - In-class presentation, 12 - 15 minutes
    1. Appropriateness of materials;
    2. Proper application of data science skills;
    3. Organization – clear and logical flow, coherent and cohesive;
    4. Delivery – clear and focused presentation;

Assessment

- **Group Project** (60%): Presentation (30%) and report (30%)
  - Written report
    1. No more than 12 A4 pages in English (excluding references, codes, and appendix)
    2. Focusing on questions, and data analytical steps (the pipelines)
    3. Interpreting the results
  - Declare workload distribution
    - NO “free rider” please.
    - You can discuss, negotiate and allocate the workload on your own within your team.
    - A declaration form will be submitted with your final project report.
    - During the in-class presentation, a table clearly show the labor distribution is required.

Class Rules

- On Class-Participation
  - No attendance requirement, but the participation is counted into the final assessment.
  - The regular participation
  - Please be punctual

Class Rules

- In-class rules.
  - “Silence is golden” - as long as you keep quite…
  - Eating and drinking?
  - You may bring your own laptop

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Data Science and Media Data Analytics at a Glance

Agenda

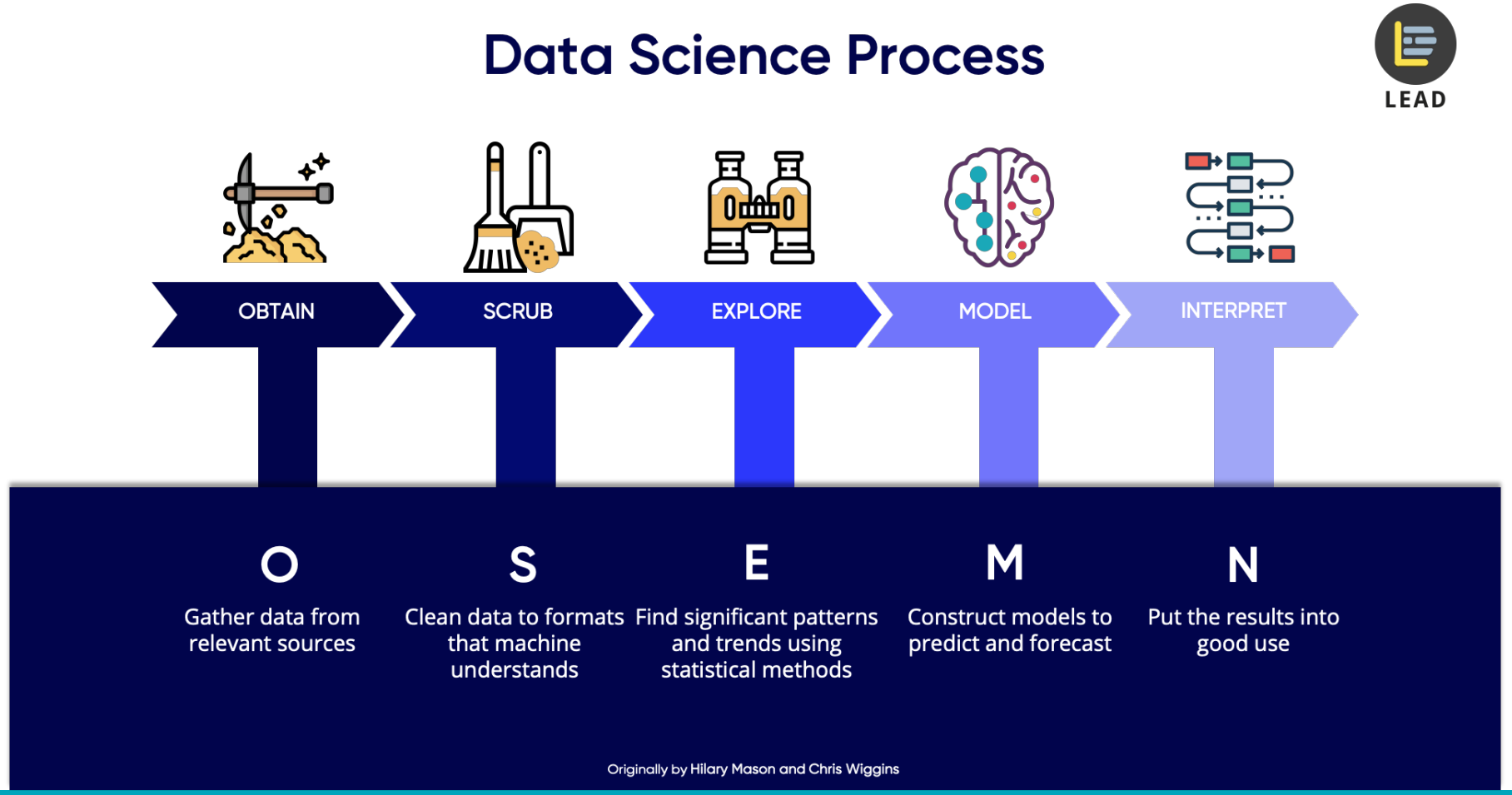
- What
  - What do data scientists do?
  - What is social media data acquisition and processing?
- Why
  - Why shall I learn this course?
  - Why web/social data?
- How (to start and succeed)
  - Tools installation
  - Practice and getting your hands dirty!

Data science in action

- Define the problem
- Scouting the data sources
- Accessing to and collecting the data
- (Pre-)processing and cleaning the data
- Exploring the data
- Analyzing the data
- Interpreting the results
- Offering insights and solutions
- …

Data science pipeline - a verbal explanation

- The “OSEMN Pipeline”

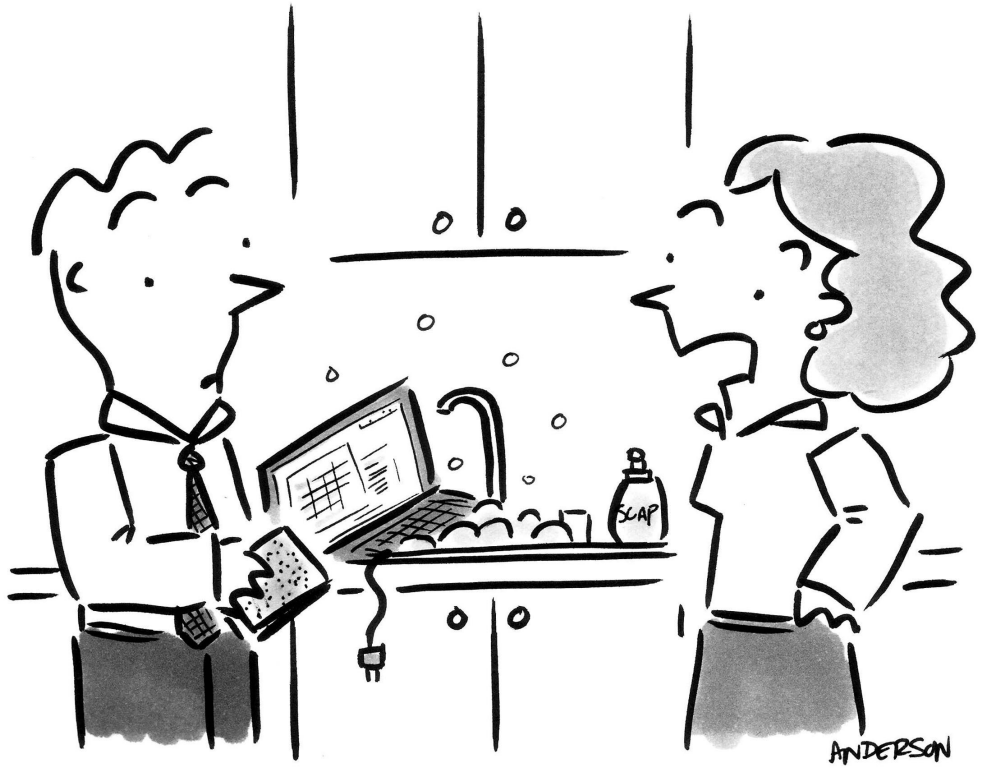


Data science pipeline

1. Obtain Data
   - You cannot do anything as a data scientist without even having any data
   - **Identify** all of your available datasets (which can be from the internet or external/internal databases)
   - Extract the data into a usable format (.csv, json, xml, etc..)

Data science pipeline

2. Scrub / Clean Data
   - **Examine the data**: understand every feature you're working with, identify errors, missing values, and corrupt records
   - **Clean the data**: throw away, replace, and/or fill missing values/errors
   - Garbage in garbage out



"This is not what I meant when I said 'we need better data cleansing!'"

Data science pipeline

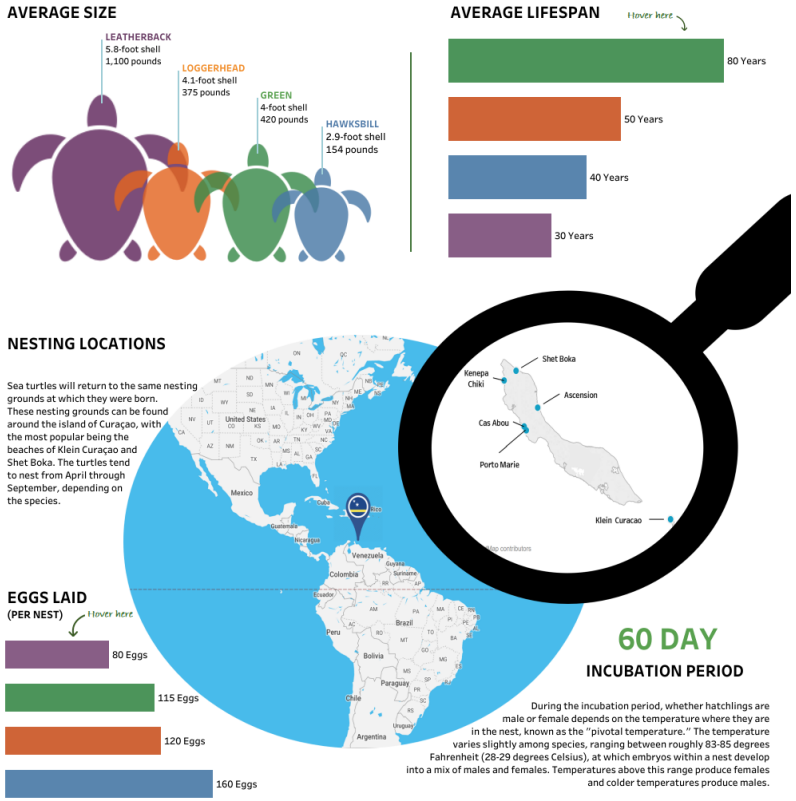
3. Explore Data
   - Find patterns in your data through visualizations and charts
   - Derive hidden meanings behind our data through various graphs and analysis

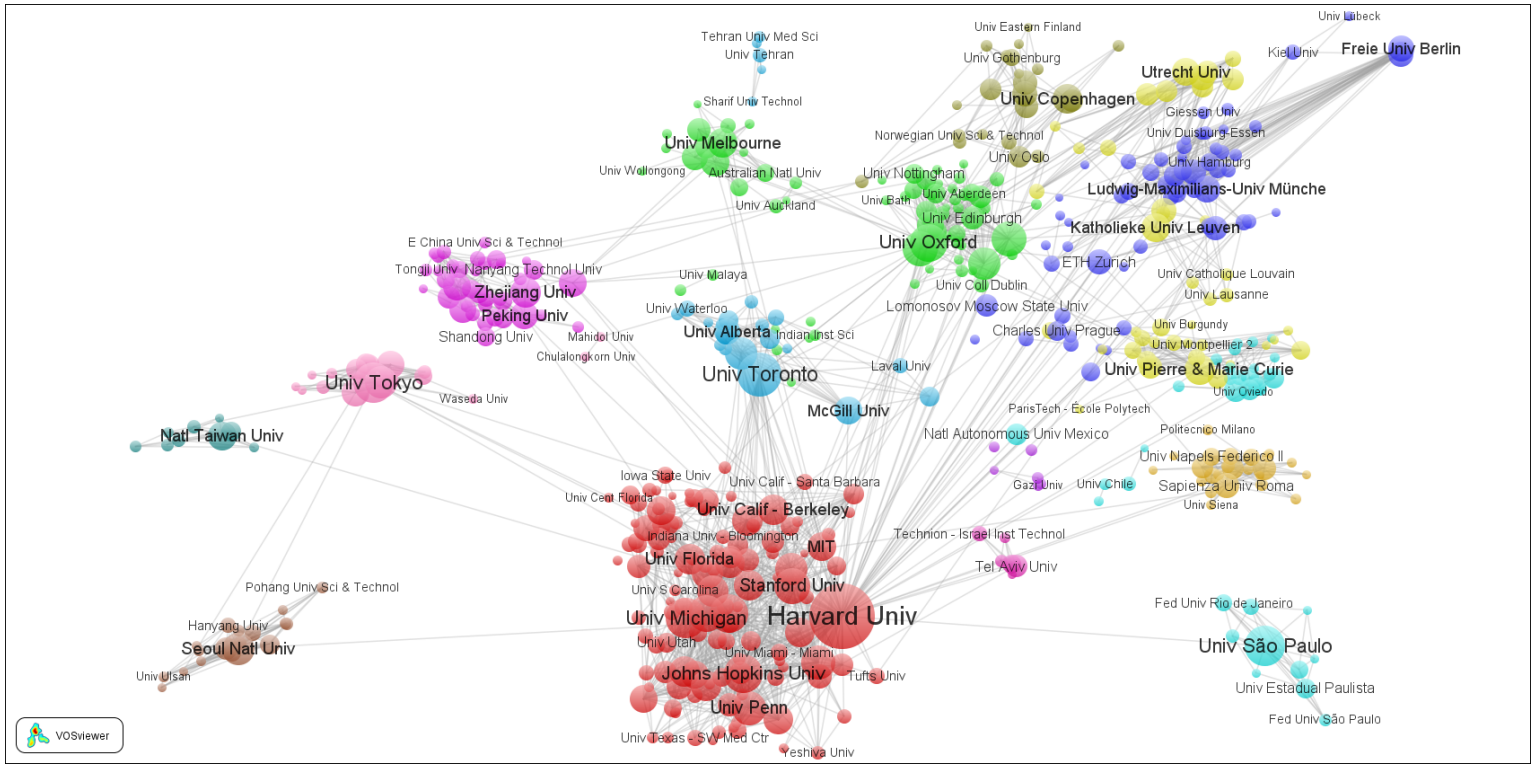
Data science pipeline

4. Model Data
   - **In-depth Analytics** create predictive models/algorithms
   - **Skills Required** Machine Learning algorithms, Linear algebra etc.
   - **Predictive Power Example** Walmart predicted that they would sell out all of their Strawberry Pop-tarts during the hurricane season in one of their store location.
     - Historical data showed that the most popular item sold before the event of a hurricane was Pop-tarts.

Data science pipeline

5. Interpret Data (Data Storytelling)
   - Visualize your findings accordingly: keep it simple and priority driven
   - Tell a clear and actionable story: effectively communicate to non-technical audience





Co-author + university collaboration network

Data acquisition and processing

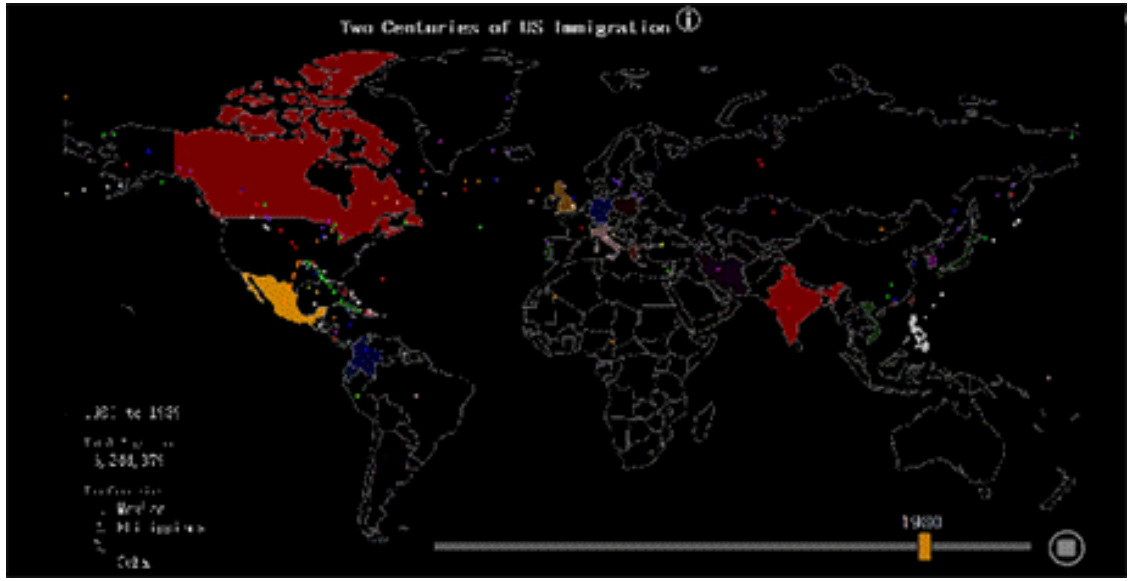
- What is social media (web) data acquisition?
  - Web data collection, data acquisition, screen scraping, data mining, web data harvesting, web crawlers…
  - “Social media” – web data, cultural and social artifacts
- Web scraping
  - It is accomplished by writing an automated program that queries a web server, requests data (usually in the form of HTML and other files that compose web pages), and then parses that data to extract needed information (Mitchell, 2018).
- Automated data collection via social media or institutions
  - The usage of APIs (Twitter, Fb, Weibo)
- It is the process of taking unstructured information from the web (webpages, sites, social media services, institutions) and turning it in to structured information that can be used in a subsequent stage of analysis.

Why taking this class?

- Increasing market demands
- The availability of digital footprints (digital traces)
- Internet as a rich database
- The field itself is becoming more interdisciplinary.
- The price and difficulty of collecting and storing massive online data has dramatically reduced.

Antisyllabus

- Basic data visualization in Python, as opposed to professional data visualization tools



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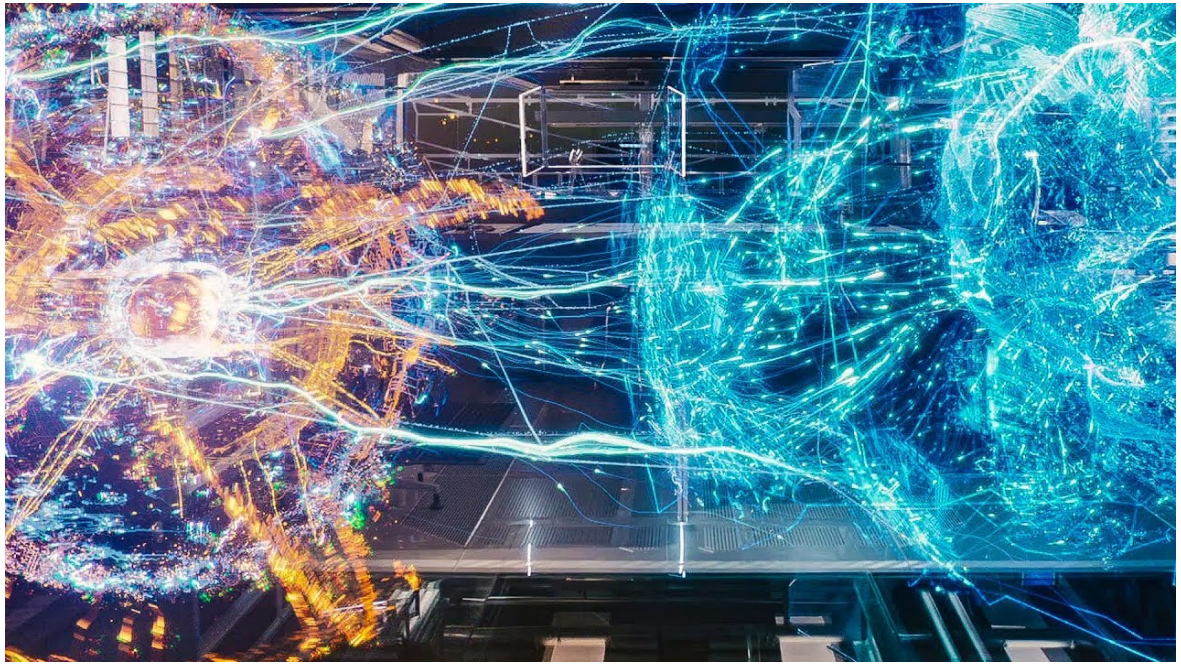
Antisyllabus

- Data analytics, without AI/machine learning



Getting started: Tools

- Talking to your computer: Command line interface (CLI)
- Text Editor: vscode, sublime, vim, emacs, or others
- Platform for publishing and socializing: Git and GitHub, and Markdown language
- The tool: Python 3.x (Anaconda 3) and Jupyter Notebook

Thank You