Social Computing

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Learning objectives

- At the end of the class, students will be able to:
  - Describe what the course is about and identify the topics to be covered in the course
  - Describe social computing and differentiate it from social science and computational social sciences
  - Define persuasion and persuasive technology
  - Identify commonly used persuasive strategies in social networks

What is Social Computing?

- Social computing is an area of CS which uses social science insights and social interaction data to design social applications and infrastructures that allow users to interact, build relationships, communicate, collaborate, share, self-organize and self-improve.

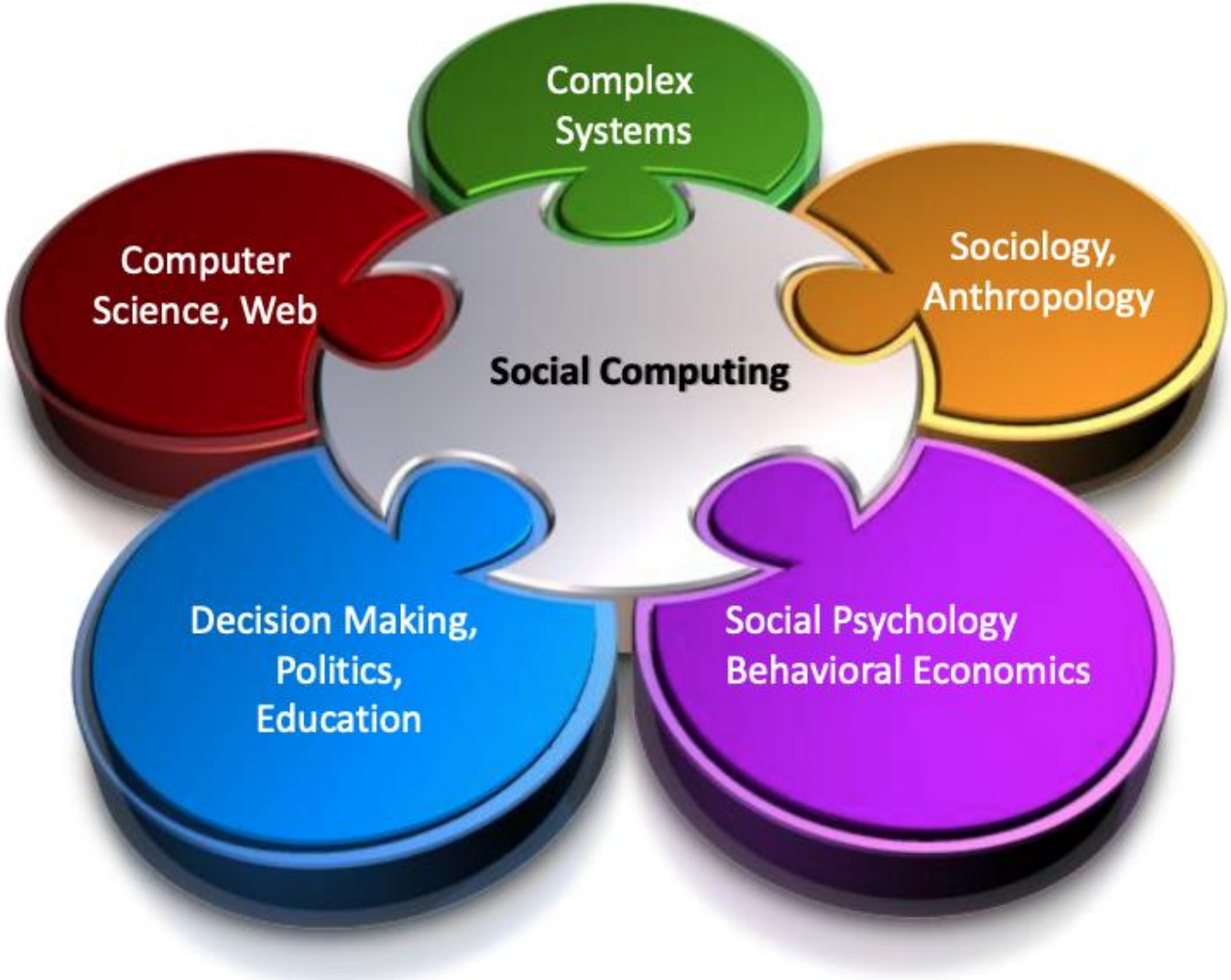
- “Social computing is an area of computer science that is concerned with the intersection of social behaviour and computational systems. It is based on creating or recreating social conventions and social contexts through the use of software and technology”. (Wikipedia, 2021)

- Blogs, discussion forums, chats, consumer-to-consumer commerce, social networks, crowd-funding apps, instant messaging etc.

Active research area

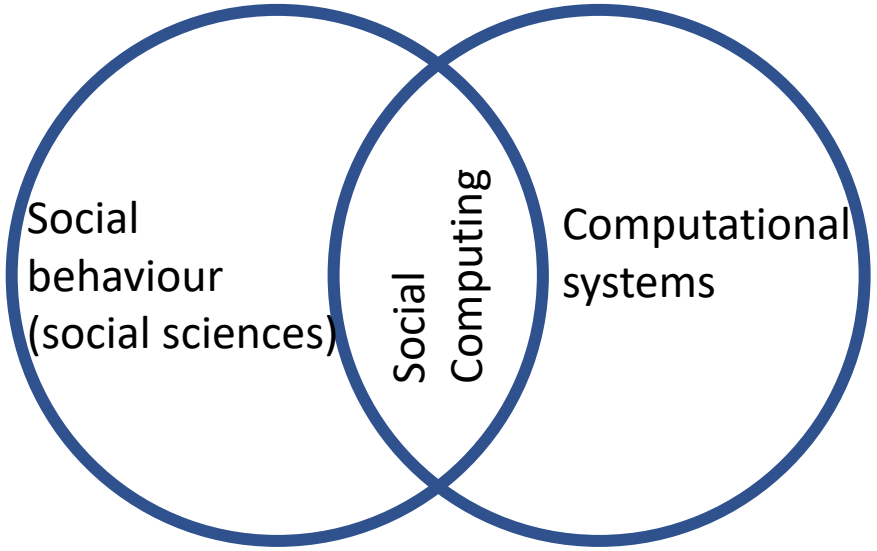
- ***ACM Transactions on Social Computing journal***
  - “ACM Transactions on Social Computing (TSC) seeks to publish work that covers the full spectrum of social computing including theoretical, empirical, systems, and design research contributions. The editorial perspective is that social computing is fundamentally about computing systems and techniques in which users interact, directly or indirectly, with what they believe to be other users or other users contributions. TSC welcomes research employing a wide range of methods to advance the tools, techniques, understanding, and practice of social computing, including: theoretical, algorithmic, empirical, experimental, qualitative, quantitative, ethnographic, design, and engineering research. ”

Social computing

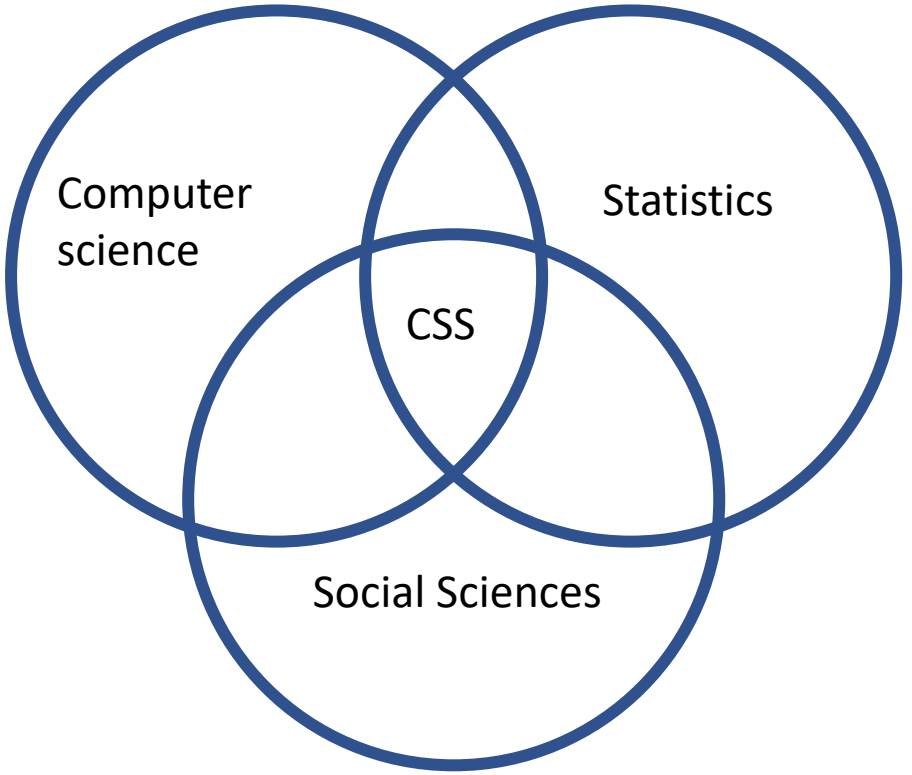


Source: Dr. Julita Vassileva's lecture notes

Social Computing Vs Computational Social Science



- Mechanisms through which people interact with computational systems
- Why, how people contribute user-generated content
- How to design more engaging systems

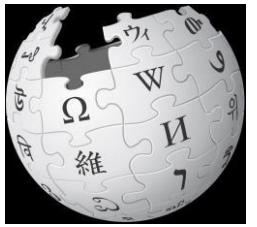


- Computers are used to model, simulate, and analyze social phenomena.
- Collaborative field
- social scientists provide context, theories, and data sources
- Statisticians and computer scientists develop mathematical models and computational tools

Social Sciences

- Analyzing the interactions in online communities
- Social phenomena from real communities can be observed in online communities
  - reputation /power economy of Wikipedia (similar to that of research community)

    A.Forte, A.Bruckman (2005) Why do people write for Wikipedia? Georgia Tech Report
  - Reward system of Stack Overflow
  - Interactions on Instagram
  - Sharing of pictures on Flickr

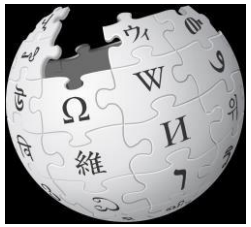


Computational Social Science

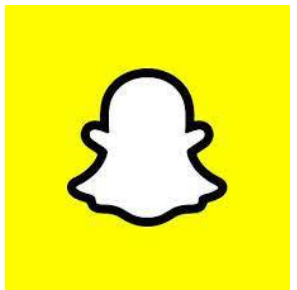
- A result of the explosion of big data in online systems
- Presents the opportunity to study society and human behaviours
- New computational methods are used to answer questions about society
- Collaborative field:
  - social scientists provide context and insight into important research questions including data sources
  - Statisticians and computer scientists develop mathematical models and computational tools

Social Computing as a field of Computer Science

- Social Computing evolved as a branch of CS that designs ways of interacting and collaborating on the web
- Became popular with the advent of Web 2.0 (participative or participatory web)
  - Emphasis is on user generated content, ease of use, participation and compatibility with multiple systems and devices



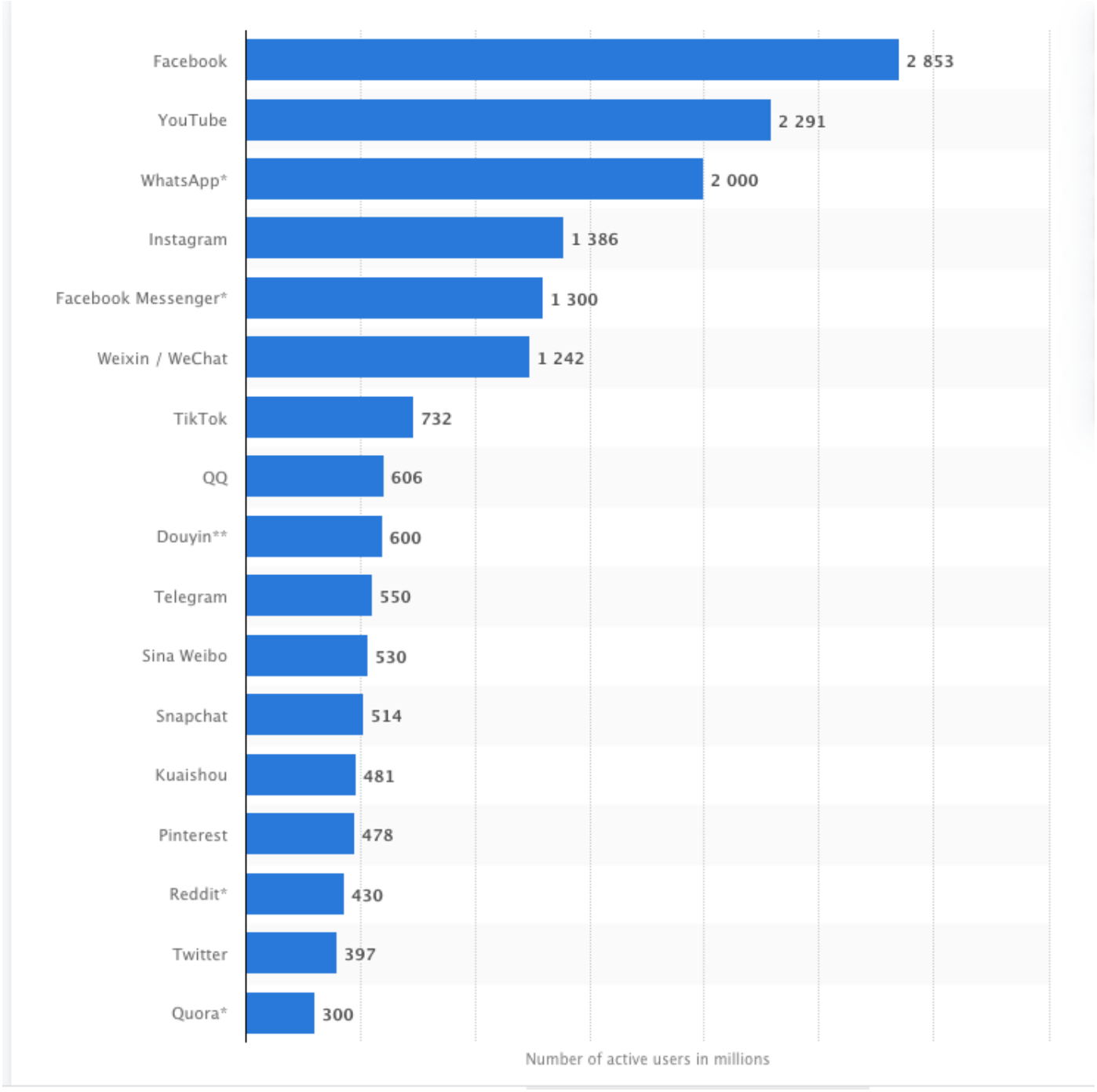






Telegram

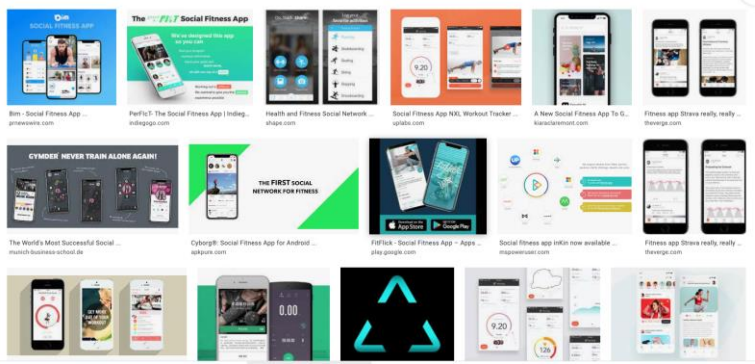

Most popular social networks worldwide as of July 2021, ranked by number of active users (in millions)

Source: https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/



Behaviour change systems

- Can social apps help people help themselves
  - To live healthier
  - Be more productive
  - Engage in useful social causes



STRAVA

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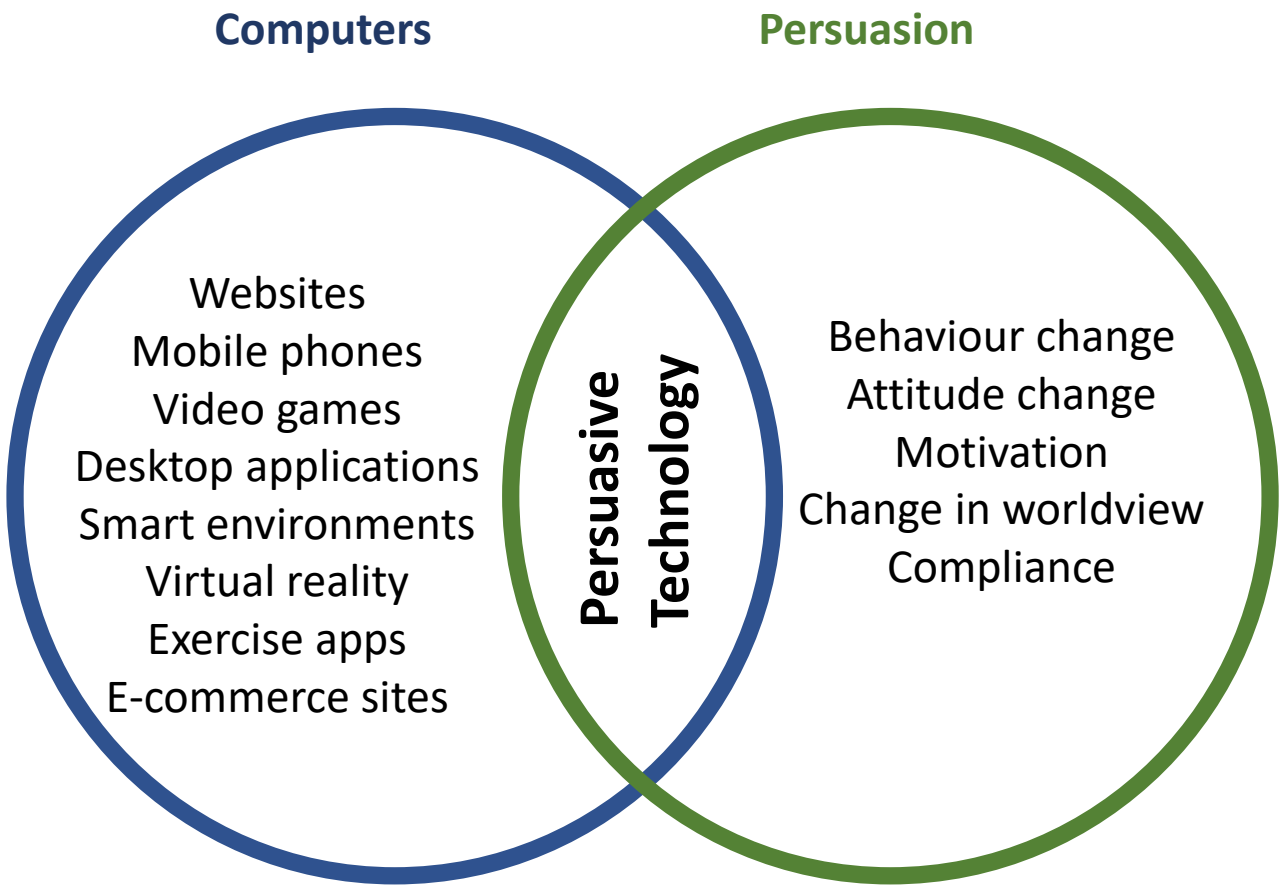
Changing Human Behaviour

- What is human behaviour?
  - An individual's habits, decisions, courses of actions, goal-setting, attitudes
- Changing human behaviour
  - Setting the environment so that it supports, cues, triggers the desired behaviour
  - Motivating people to do certain things
- Theories of Persuasion from Psychology
  - Persuasion can be used to influence participation in a social network

Persuasion and Persuasive Technology

- BJ Fogg (2003)
- Persuasion: influence a change in attitude or behaviour without coercion
- Persuasive technology: adaptive systems designed to change attitudes or behaviour using persuasion



Source: Dr. Julita Vassileva's lecture notes

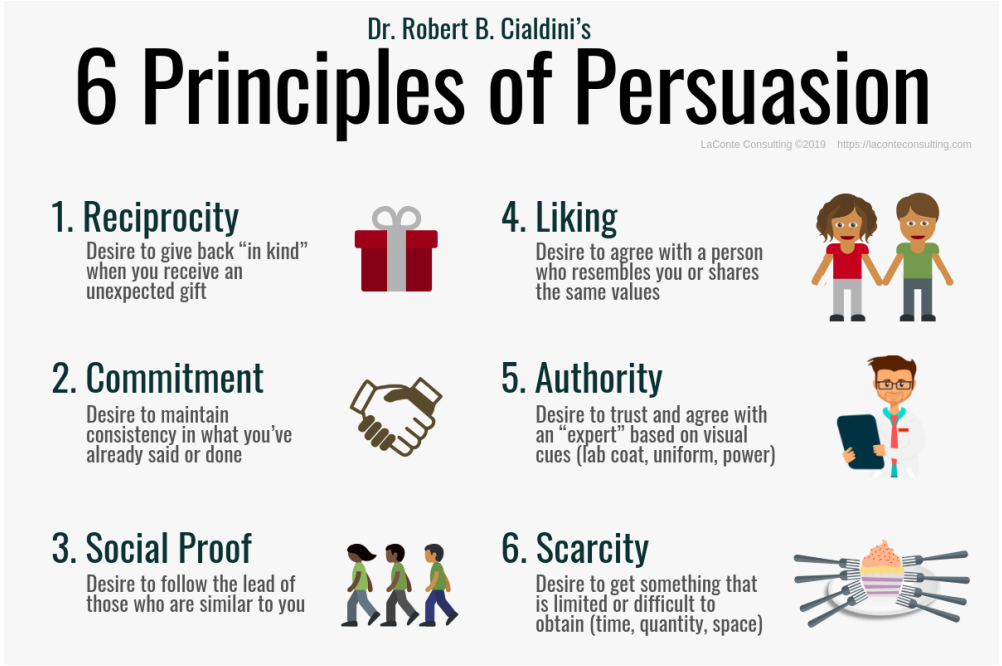
Persuasive strategies used in designing Persuasive Technologies

- BJ Fogg's 7 persuasive strategies
  - **Reduction** – Simplifying a task, e.g., one click by Amazon
  - **Tunneling** – Sequence of steps to accomplish a task, e.g. install a new application
  - **Tailoring** – Customizing application to the user, e.g. When logged in, no need to re-enter shipping address on Amazon, being able to see your previous orders
  - **Suggestion** – "Recommended items similar to your past purchases" on Amazon, Netflix, YouTube etc
  - **Self-monitoring** – Track one's behaviour e.g. past orders on Amazon, completed courses on Coursera
  - **Surveillance** – Observe user in order to influence a target behaviour, e.g. surveillance camera in stores to prevent theft
  - **Conditioning** – Reinforcement (or punishment) to a user to influence a target behaviour, e.g. rewards (badges, points) in Stack Overflow

- Can you identify any of these in the popular social networks mentioned earlier?
- How can you use them in the design of your social space?

Persuasive strategies used in designing Persuasive Technologies

- Cialdini's 6 persuasive strategies (commonly used in marketing)
  - Reciprocity
  - Commitment
  - Social proof
  - Liking
  - Authority
  - Scarcity



https://laconteconsulting.com/2019/07/08/mlms-psychology-of-influence/

- Can you identify any of these in the popular social networks mentioned earlier?
- How can you use them in the design of your social space?

Incentive mechanisms

- Can also be used to influence participation
- Show status/reputation

- What incentive mechanisms does FB, IG, Netflix have
- How can you use incentives in the design of your social space?

Badges

Besides gaining reputation with your questions and answers, you receive badges for being especially helpful. Badges appear on your profile page, flair, and your posts.

All | Earned | Unearned | Gold | Silver | Bronze

Question Badges

stackoverflow

Altruist	First bounty you manually award on another person's question	10.3k awarded
Benefactor	First bounty you manually award on your own question	50.4k awarded
Curious	Ask a well-received question on 5 separate days, and maintain a positive question record	374.3k awarded
Inquisitive	Ask a well-received question on 30 separate days, and maintain a positive question record	37.5k awarded
Socratic	Ask a well-received question on 100 separate days, and maintain a positive question record	4.9k awarded
Favorite Question	Question bookmarked by 25 users	61.7k awarded
Stellar Question	Question bookmarked by 100 users	9.2k awarded
Investor	First bounty you offer on another person's question	21.5k awarded
Nice Question	Question score of 10 or more	716.8k awarded
Good Question	Question score of 25 or more	247.8k awarded

https://stackoverflow.com/help/badges

Recommender systems

- Help users find relevant content
    - Purchase recommendation on Amazon
    - Movie or music recommendation on Netflix or YouTube
  - Can be based on the features of previous history (e.g. past purchase), activity of similar others (e.g. what similar other shoppers have purchased) or both
  - System mines users' data to create profiles of users based on demographics, preferences, interests, previous purchases, context, etc.
  - Privacy concerns: who owns the data? Who can access it? what can they do with it?

Crowdsourcing and wisdom of the crowd

- Crowdsourcing

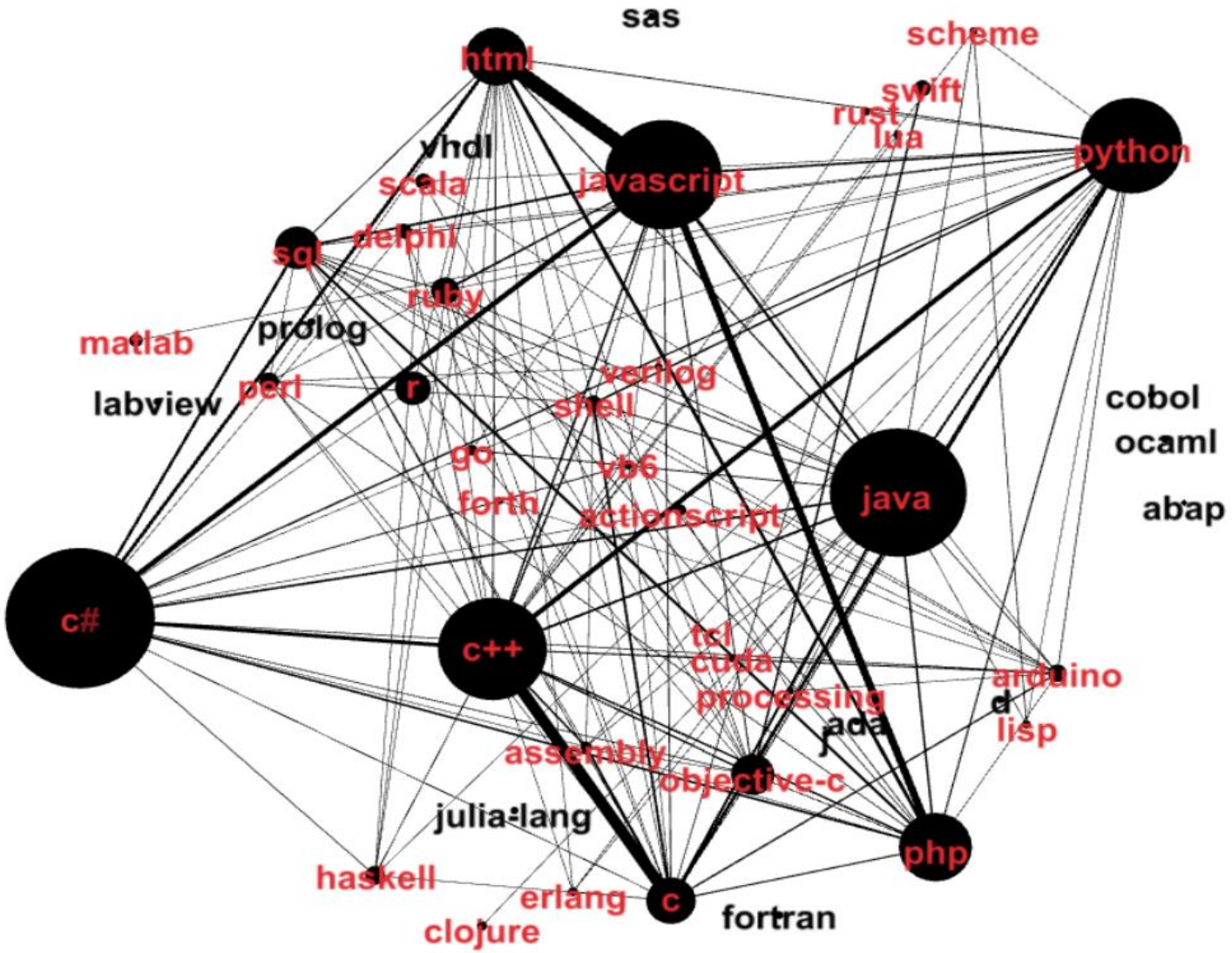
- Gather information, opinions, work from large groups of people online
  - Netflix's algorithms challenge
  - Kaggle's data science challenge
  - My Starbucks Idea- Submit ideas for Starbucks products or community initiatives.

- Wisdom of the crowd is the collective opinion of a crowd (a group of people) instead of that of an expert
- Individually, one might not be good, but when they come together as a group, they may be better
- Collective wisdom is something that emerges as a result of many different independent judgments, not something that the group should consciously come up with.

Social network analysis

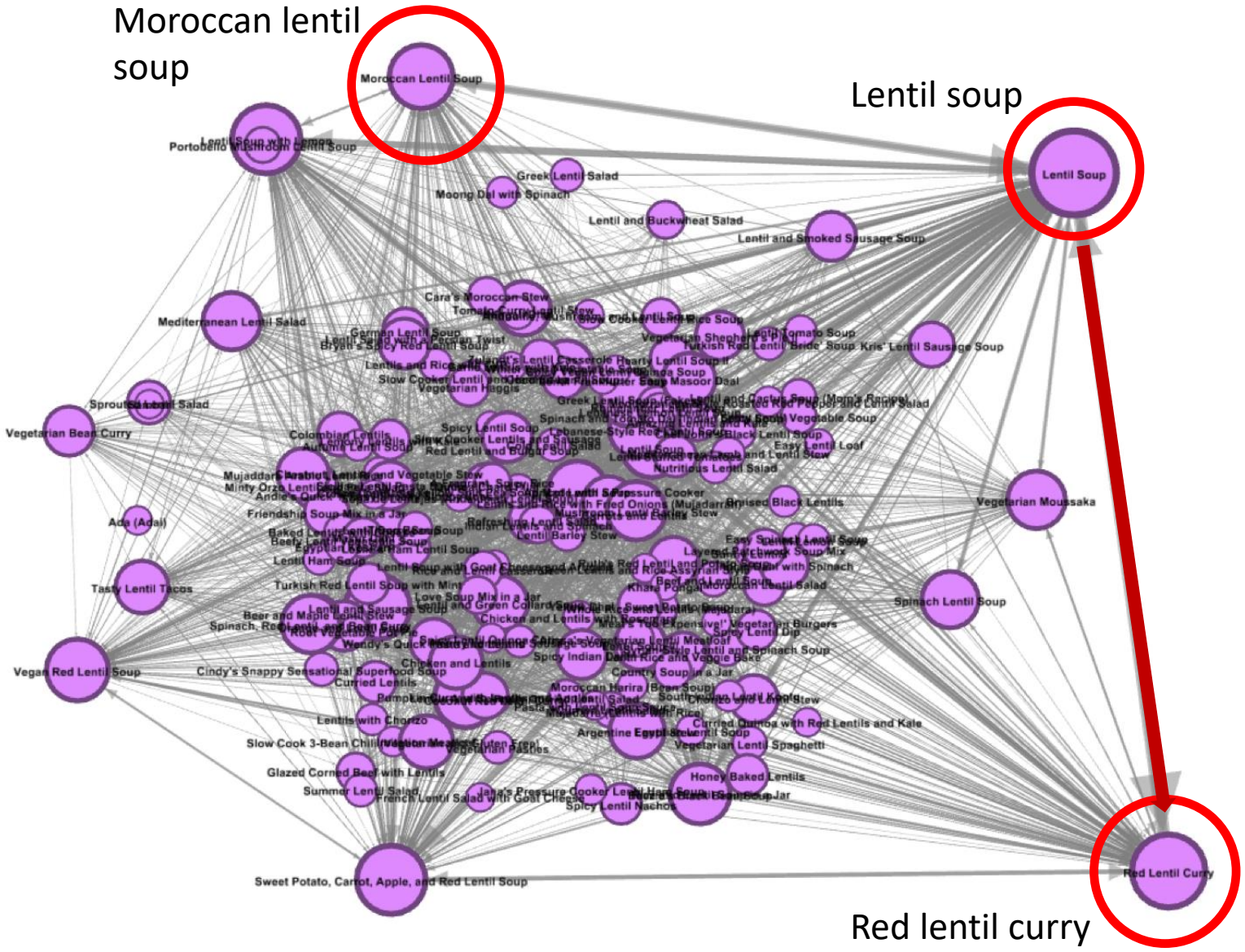
- Analysis of the structure of relationships between social entities in social network
- Process of investigating social structures in networks
- SNA uses mathematical concepts & graph theory
- Consists of nodes (circles) and edges (lines between circles)
- Nodes can be individuals, actors, people or things within a network (books in a library)
- Edges are relationships between nodes (retweet, follow, citation, etc.)
- Can provide insight into social influence within a network
- Can identify people of influence within a network.

Social network analysis



- Odiete, Obaro, Tanvi Jain, **Ifeoma Adaji**, Julita Vassileva, and Ralph Deters. "*Recommending Programming Languages by Identifying Skill Gaps Using Analysis of Experts. A Study of Stack Overflow*." In Adjunct Publication of the 25th ACM International Conference on User Modeling, Adaptation and Personalization, (UMAP), (pp. 159-164). ACM, 2017.

Social network analysis



- Can be used for recommendation (e.g. recommending recipes)

- **Ifeoma Adaji**, Czarina Sharmaine, Simone Debrowney, Julita Vassileva, *"Personality based Recipe Recommendation Using Social Network Graphs"*, Proceedings of the 11th International Conference on Social Computing and Social Media, (pp. 161-170), Springer, Cham, July 2018.

Other Topics

- Designing engaging social sites and the engagement lifecycle
- Fairness, Accountability, Transparency, and Ethics
- Privacy and security
- Mining social data
- Community visualization
- Cognitive biases
- Scale free networks

- Students interested in social computing research should please contact me by email (ifeoma.adaji@ubc.ca)
- Course materials, assignments etc. on Canvas
- I acknowledge the use of some of Dr. Julita Vassileva's resources (with permission)