





Sentiment, Stance, and Communicative Power

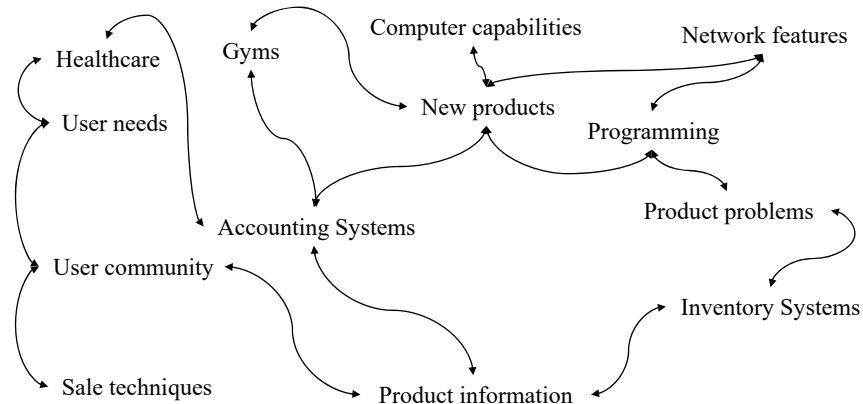
Dr. Kathleen M. Carley
kathleen.carley@cs.cmu.edu

Semantic Network

- Network of concepts
- Sometimes referred to as
 - a mental model
 - An information network
- Generally extracted from texts
- Variations on nodes
 - Words –vs- concepts
 - topics –vs- concepts
- Features of links
 - Co-use or logic or semantic relations
 - Strength – generally represents frequency
 - In text or across texts



Illustrative Semantic Network



Netanomics



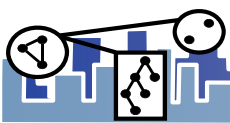
Why compare texts as networks: Locating Common Ground

- Do people use same words
- Do people use same words in same way
- Do people evoke the same concepts
- Do people link the same concepts in the same way
- Are the same disciplines employed
- Are the same journals, trade magazines, etc. read

Netanomics

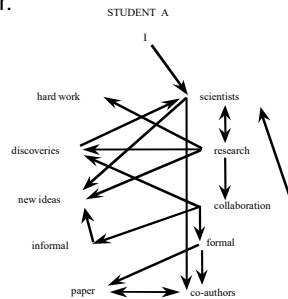


CASOS

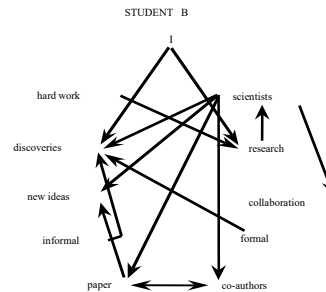


Information Network:Text & Graphics

Student A: I found that scientists engage in research in order to make discoveries and generate new ideas. Such research by scientists is hard work and often involves collaboration with other scientists which leads to discoveries which make the scientists famous. Such collaboration may be informal, such as when they share new ideas over lunch, or formal, such as when they are co-authors of a paper.



Student B: It was hard work to research famous scientists engaged in collaboration and I made many informal discoveries. My research showed that scientists engaged in collaboration with other scientists are co-authors of at least one paper containing their new ideas. Some scientists make formal discoveries and have new ideas.

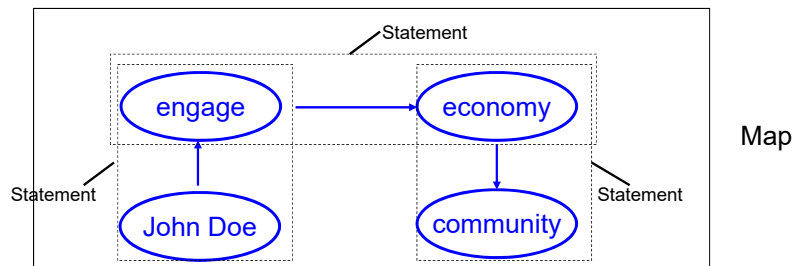


Netanomics

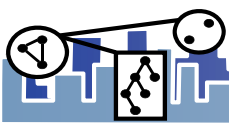


Window Based Location of Links

- John_Doe is actively engage in several economy and community.



Netanomics



Extraction of Relational Data From Texts – Toy Example

Example from UN News Service (New York), 12-28-2004:
 "Jan Pronk, the Special Representative of Secretary-General Kofi Annan to Sudan, today called for the immediate return of the vehicles to World Food Programme (WFP) and NGOs."

extract relational data

One-mode networks
semantic networks

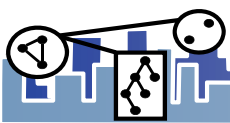
multi-mode networks
meta-networks

● Knowledge

● Person ● Organization
● Location ● Resource

Default Ontology

- Named Entities
 - Agent
 - Individual actors
 - Specific – unique often with first and last name - Jamie O'Connor
 - Generic – non-unique and often a role - haberdasher
 - Organization
 - Groups, corporations, populations
 - Specific – unique - IBM
 - Generic – a type - Non-government organization
 - Location
 - Places things can be at
 - Specific – unique with lat and lon or place on map – United States of America
 - Generic – may be at multiple locations – hill
 - Event specific, generic
 - Major happenings that impact groups
 - Specific – occur once – World War I
 - Generic – multiple occurrences - Tornado



Default Ontology



- General Entities

- Knowledge
 - Branches of knowledge
 - Topics of interest
- Resources
 - Things that are not purely mental – disease, food, wire
- Tasks
 - Activities – eat
- Beliefs
 - "isms" - Catholicism
 - Sentiment – positive, negative
 - Belief statements – right to bear arms

Sentiment

- Assessed often using tools like LYKE or VADER
- Positive/negative score to text based on affective word choice
- More detailed is affect control theory
 - EPA rating
- Overarching or global sentiment too course
- Local or context based sentiment

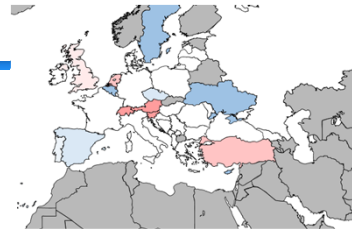
Tweets mentioning NATO that can be attributed by country suggest:

- negative sentiment toward NATO in Turkey and Slovakia
- positive sentiment toward NATO in Belgium

But ...

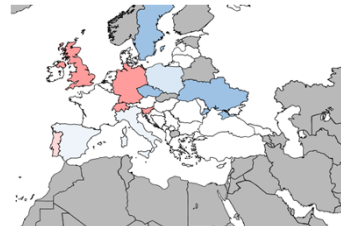
- General Sentiment
- Negative tweets in those countries are not negative about NATO
 - 90% of tweets identified by most sentiment miners that mention NATO and are positive or negative are not so ABOUT NATO
- Context based Sentiment
 - 80% are positive or negative ABOUT NATO
- Most negative about NATO are: England, Germany, Switzerland, Hungary
- Most positive about NATO: Sweden, Czech Republic and the Ukraine

General sentiment



Blue is positive
Red is negative

Context Sentiment About NATO



What is Stance?

- Stance is defined as: A mental or emotional position adopted with respect to a proposition, a topic, a person, an idea etc. 1
- Stancetaking is a public act of evaluating objects, positioning subjects and aligning with other subjects.2

1: <https://www.thefreedictionary.com/stance>

2: Du Bois, J. W. (2007). The stance triangle. *Stancetaking in discourse: Subjectivity, evaluation, interaction*, 164(3), 139-182.

Pro Stance Stance Is Not Positive Sentiment



Ian French @siceo · 3 Nov 2015

So ice cap in **Antartica is GROWING** not shrinking!
The "green" climate change agenda needs honest challenge
[#climatechange](#)
[#GlobalGoals](#)

@Ian French believes that "climate change is a hoax".
The text in this Tweet is mostly positive.

- In stancetaking, a pro-stance can be taken without using words with positive sentiment. Similarly, an anti-stance can be taken without using words with positive sentiment.