

Network Science

Networks Based

on

Co-Occurrences

Lab 04

Lecture 11

Today's topics

- Constructing Semantic and Product Networks
- Discovering the Network Structure

Next Lab:

- Case Study: Cultural Domain Analysis
- Case Study: from Products to Projects

Semantic and Product Networks

co-occurrence: the property of items being in the same place at the same time

here edges are implicit:
you have to deduce, extract, calculate them from other data

We will discover the structure of a network: components, cores, coronas, communities, ...

two examples:

semantic networks

product networks

Semantic Networks

nodes are terms: words, word stems, word groups or concepts

links connect terms that:

- i) are commonly used together ("complex" — "networks")
- ii) describe the same property ("red" — "blue")
- iii) are semantically comparable
(synonyms: "program" — "app"
hypernyms: "pet" — "cat"
antonyms: "create" — "restore")

Semantic Networks are used by knowledge specialists for semantic domain analysis

Example: Cultural Domain Case Study

Product Networks

Retail Networks :

nodes are items purchased
by individuals

links represent co-occurrence
of items in customers
in their "shopping baskets"

items are complements

weights : frequency of co-purchasing

Example : from products to
projects Case Study

Discovering the network Structure

the Web is (or was...) a
bow-tie.

How can we replicate such an
analysis on other networks?

For example: we want to
find the Giant Conected Component
and also:

isolates, components, cliques, communities,
K-cores, ...

open 10 - makeFigures.ipynb

and learn how to do
that with networkx

