The Semantic Web Landscape

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Semantic Web – what it is and isn't

Lot's of cool technologies that could be seen as "Semantic":

What does "Semantic" mean?

Definition of *SEMANTIC*
1: of or relating to meaning in language

What is the meaning of meaning?

What is the "Web"?

A way to share **documents** on a global scale.
Anyone can **read** any **document** on the web

What is the "**Semantic** Web"?

A way to share **data** on a global scale.
Anyone can **query** ~~any~~ **data** on the web
all

Problems you can solve on the web

- **Search** (help me find what I am looking for)
- **Comparison** (help me compare two things)
- **Route planning** (get me from here to there)
- **Diagnosis** (what's wrong with me?)
- **Measurement** (how much? How far?)
- **Broadcast** (let everyone know)
- …

Semantic Web doesn't do any of these – it allows data to be shared, to facilitated these functions and more
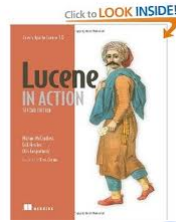
Example: search
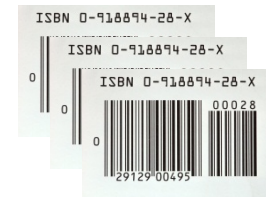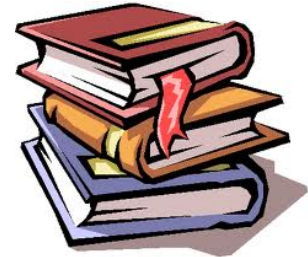
An index to guide the search

Stuff to search through (information, products, services, …

Example: search

- Text analytics?

- Link analytics?

- Crowdsourcing?
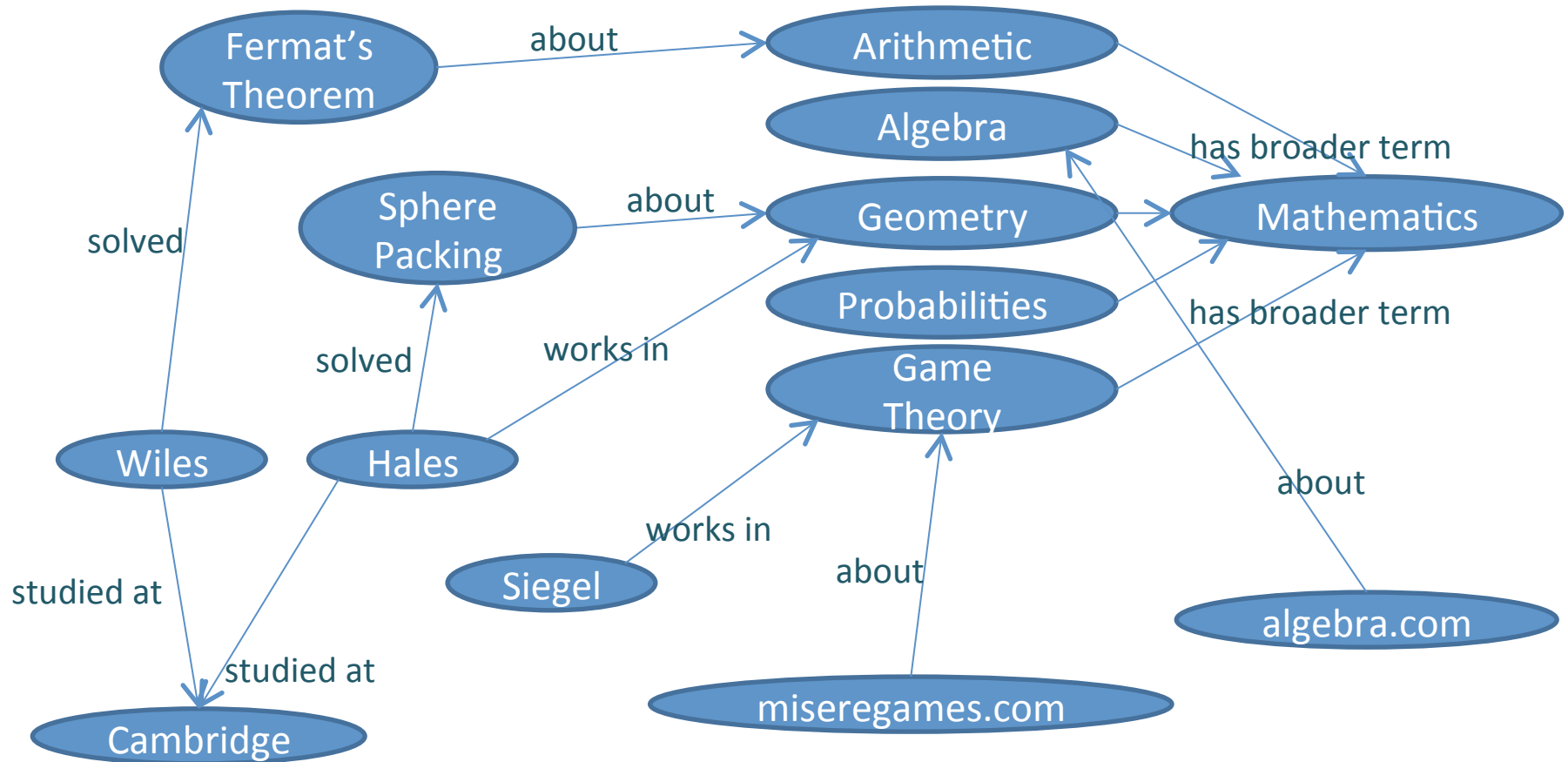
- Self-annotation?

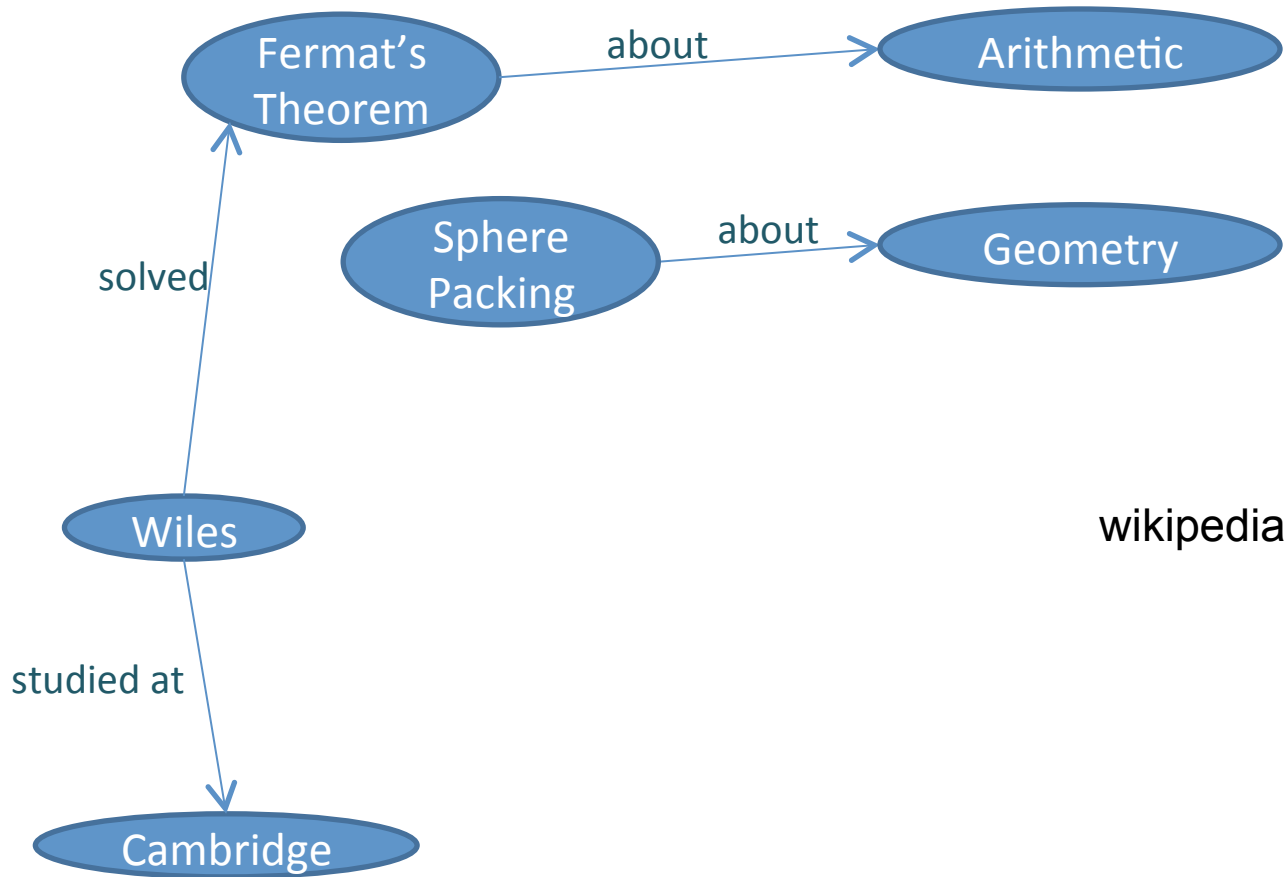- Expert curation?

Where does that
index come from?

Sharing data on the Semantic Web

Semantic Web description of Mathematics (abridged)

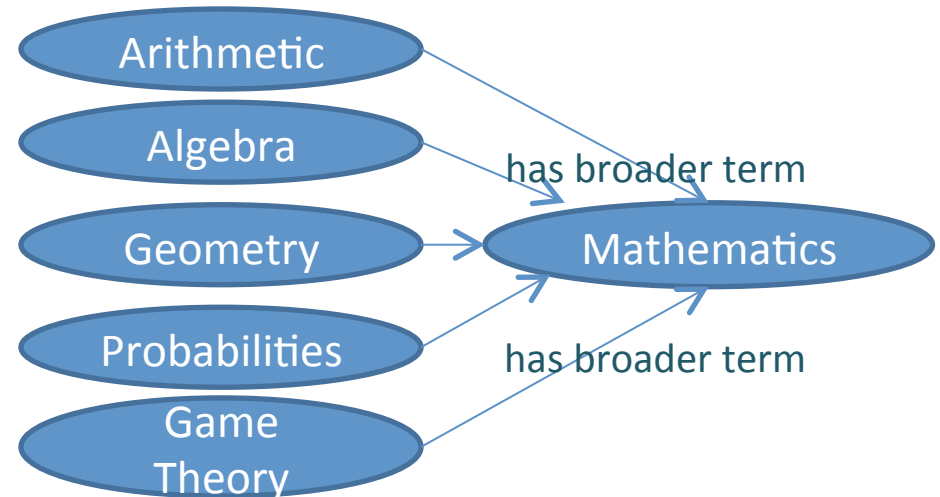Semantic Web – emphasis is on the "**WEB**"

Semantic Web description of Mathematics (abridged)

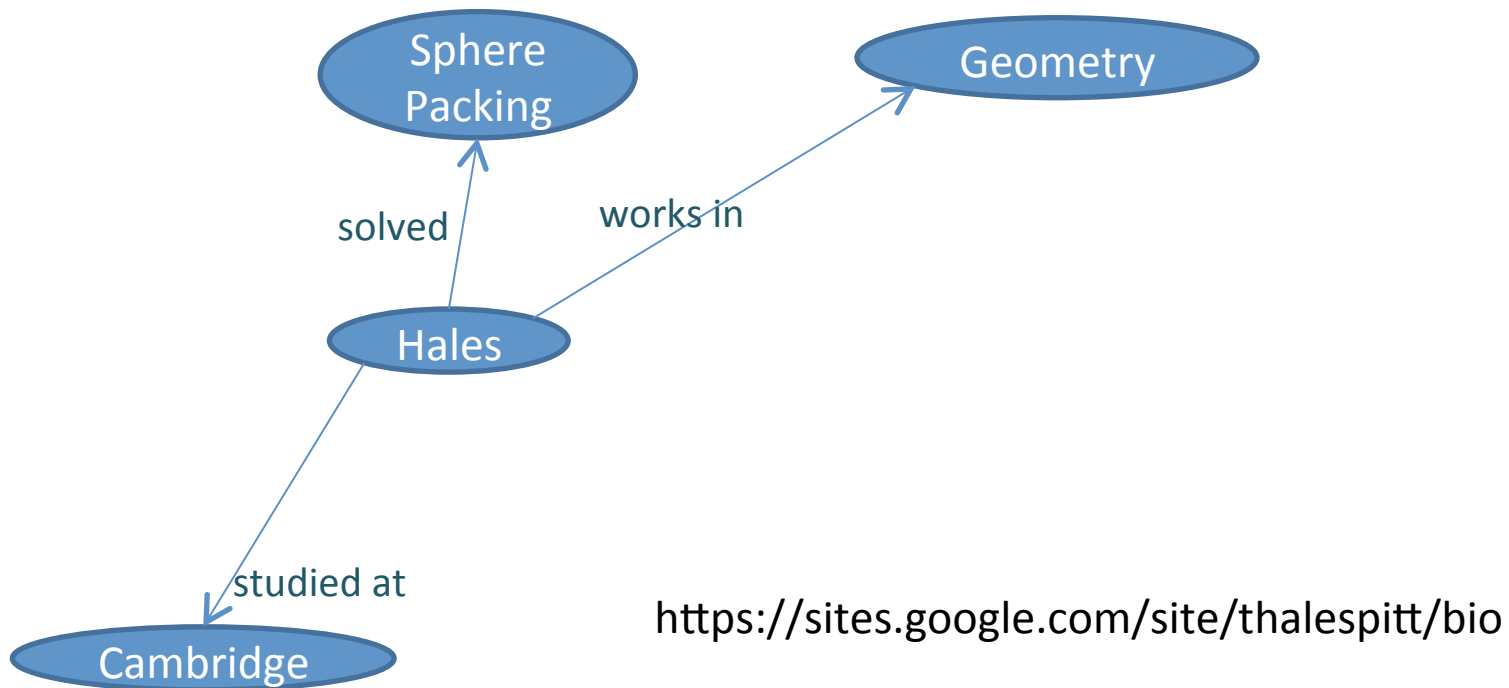Semantic Web – emphasis is on the "**WEB**"

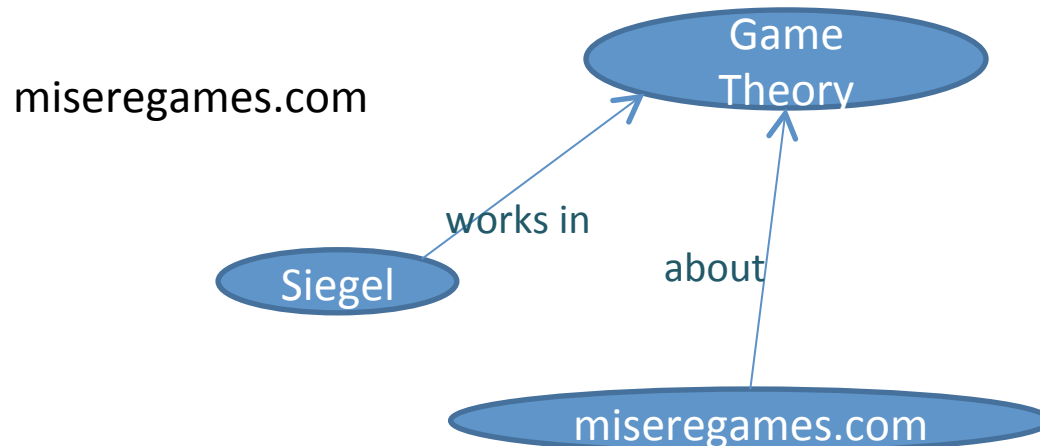# Semantic Web description of Mathematics (abridged)

Library of Congress

Semantic Web – emphasis is on the "***WEB***"

Semantic Web description of Mathematics (abridged)

Sphere Packing

Geometry

solved

works in

Hales

studied at

Cambridge

https://sites.google.com/site/thalespitt/bio

Semantic Web – emphasis is on the "*WEB*"

Semantic Web description of Mathematics (abridged)

miseregames.com

Semantic Web – emphasis is on the "***WEB***"

Semantic Web description of Mathematics (abridged)

Algebra

about

algebra.com

algebra.com
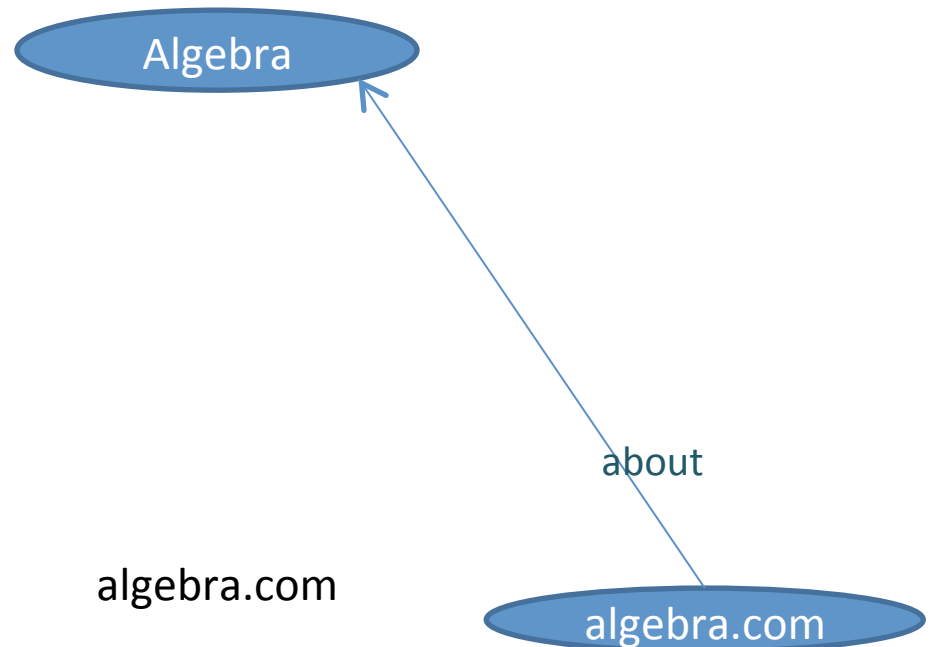
Semantic Web – emphasis is on the "**WEB**"

On the Semantic Web, metadata is as easy to manage as data

Example: Structured Search

"Find me someone who has 'Semantic Web' as part of their job title"

What kind of index would we need to answer this sort of question?

Interlingua

Suppose we all agreed on how to represent information about a person. Suppose that we all used that to mark up our pages. Now we could search all the information about all the people in a uniform manner.

This is the basis of microformats and schema.org

Interlingua

What if there are competing formats?
Easy – get the other guy to change!!

… or have a way to talk about how they relate.

What is an "Ontology"?

- Person
    - Name
        - Title
        - First, middle, last
    - Position
        - Organization
        - Title
    - Address
        - Street address
        - City
        - State
        - Country
        - Zip Code
    - Phone number
        - Work
        - Home
        - mobile

- Employee
    - Name
        - Employee number
        - First, middle, last
    - Job
        - Division
        - Job Description
    - Address
        - Street address
        - City
        - County
        - Country
        - Post code
    - Phone number
        - Work
        - Home
        - mobile

- Sharable, modular piece of metadata.
    - Sharable = referenceable from other places
    - Modular means self-contained
    - Metadata describes other data

Web of metadata

Ontologies refer to one another just as web pages do
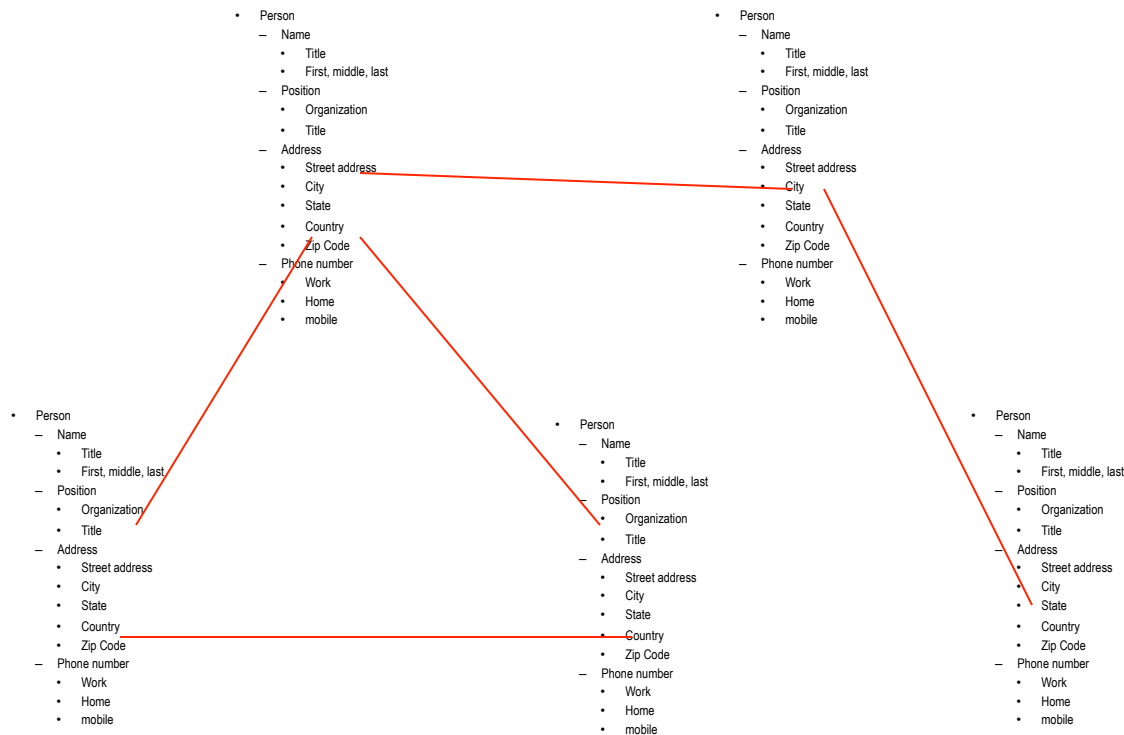
Semantic Agents on the web

- Agents provide services for people
- Agents read data from pages
- Agents merge data from multiple pages
- Examples:
  - Mashups
  - Auto-fill forms
  - Facebook "like" or "share" buttons

Life in the Data Cathedral

- Everything follows strict rules
- Only civilized things allowed in
- Everything under control

Living in the data wilderness

- Caveat emptor
- Data is in multiple formats, multiple schemas, unknown quality

- The web grew as a wilderness

Two Strategies for How The Web was Won

1. First, get everything into the same form, get everyone to agree, get them all into the Cathedral. Then, data exchange is easy.

2. Learn to live in the wilderness, making use of the valuable things there, while dealing with the dangerous ones.