

# How ontologies can help NPIs research and practice: challenges, limits and promises?

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# NPIs: The need for Ontologies

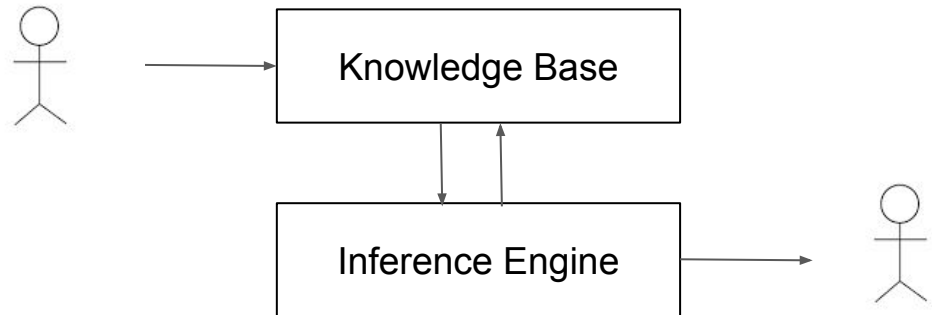
- CEPS Platform
- Master Data - Reference
- Serve both machines and human experts

CEPS  
PLATFORM

MOTRIAL

# Domain Knowledge Representation

- Representation of **domain knowledge**
- Knowledge can be **provided by experts**, by users and/or can be **inferred**
- Classes and instances
- Knowledge is all about **relationships**
- Relationships can be of several types:
  - **synonym**, antonym, homonym, **hyponym**, associated\_to, is\_consequence\_of, ...



# Managing the complexity of relationships

- **Representing the knowledge is crucial for intelligent systems to process**
- **If the knowledge is hidden (e.g. “bag of words” instead of relationships) then the system is badly processing**

<http://bookenstock.blogspot.fr/>



# Representing and Sharing

5 : observer la nature      9 : animaux      7 : poissons

**ZOOLOGIE**  
(Mot clé qui renvoie au fichier matière)

**597**  
(Cote à 3 chiffres)

**Auteur : Paul Lepêcheur**

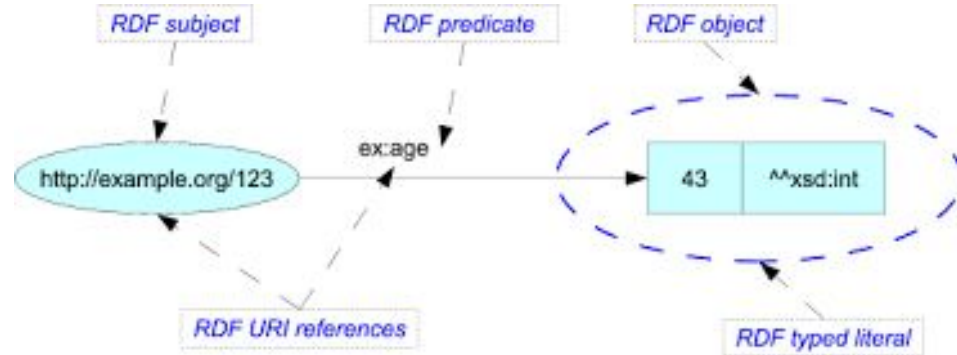
**Titre : Les poissons des lacs et des rivières**

**Editeur : Editions du Naturel**

**Fiche-matière**  
Pour les ouvrages documentaires

A classer dans le fichier matières

**542**  
(n° d'inventaire)



# Taking Contexts into account

- **Contexts and polysemy are essential**
- **Managing Facettes**

# Visualizing ontologies: challenges and approaches

## Challenges

- Complex structure of ontology
- Huge number of instances attached to ontology classes
- Efficient visualization for large ontologies
- Multi-colors for different parts of ontology
- A lot of human effort to build a new graphical tool for the visualization of ontology

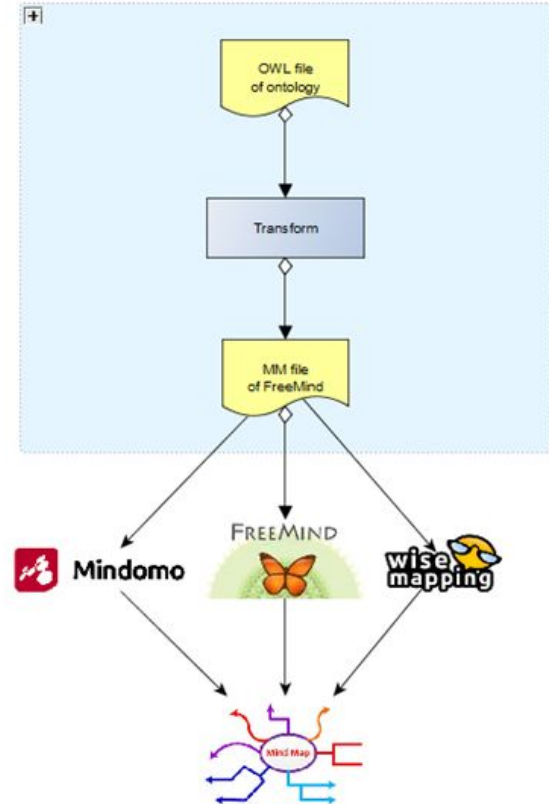
# Related work

- Most of existing tools in the literature are not able to visualize all elements of a large ontology.
- Some of tools (OWLviz, OntoGraf, TGViz) only focus on each part of ontology.
- Others (WebVOWL, OWLGrEd) display a lot of elements → confused visualization of large ontologies.
- No tools allow users to customize colors for different parts of ontology.

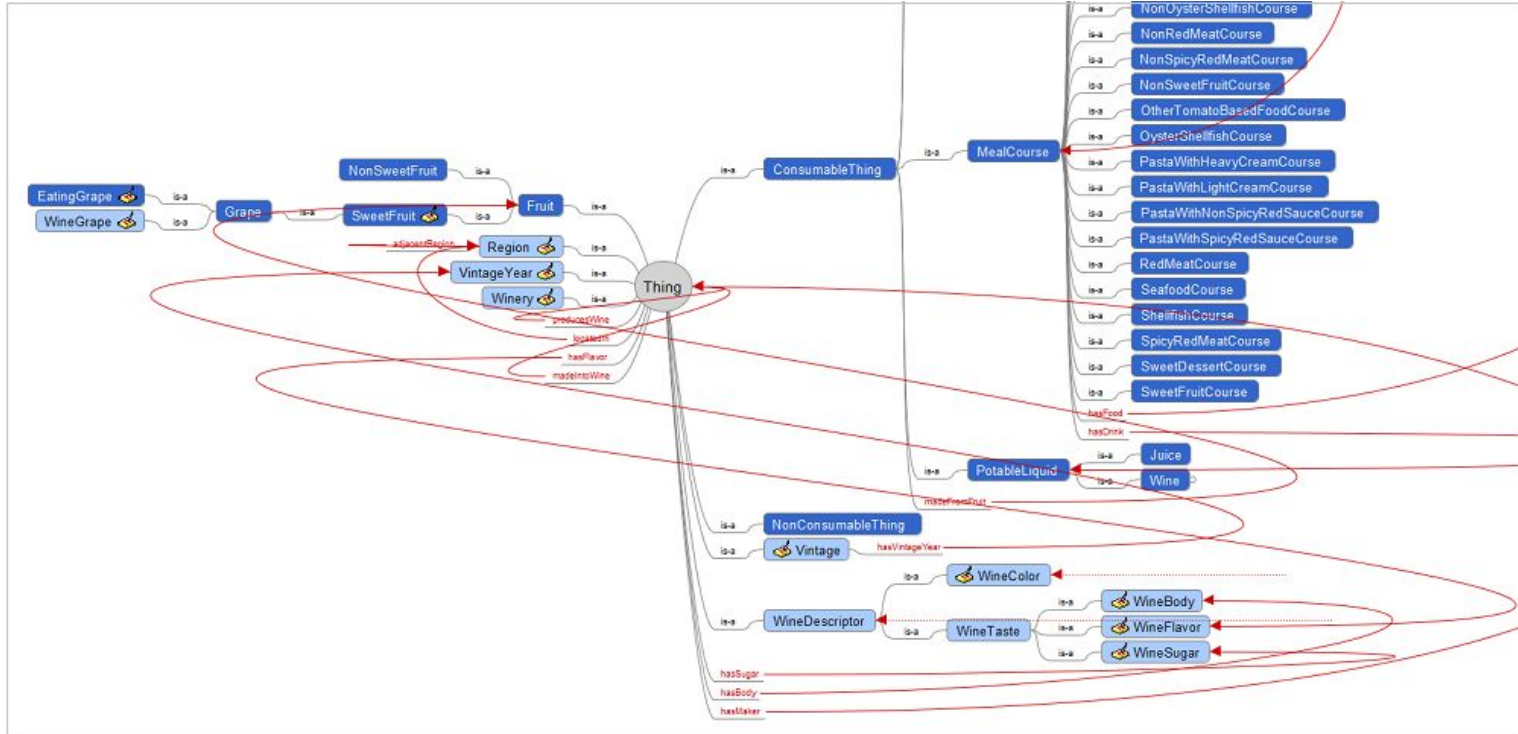


# Approach: Visualizing ontologies as MindMap

- Transforming OWL documents to FreeMind documents:
  - Classes → Bubble nodes
  - Object properties → Fork nodes + ArrowLink
  - Data properties → Notes popup
  - Instances → Notes popup
- Display the resulting FreeMind documents as MindMaps in different Mind-mapping tools



# Result



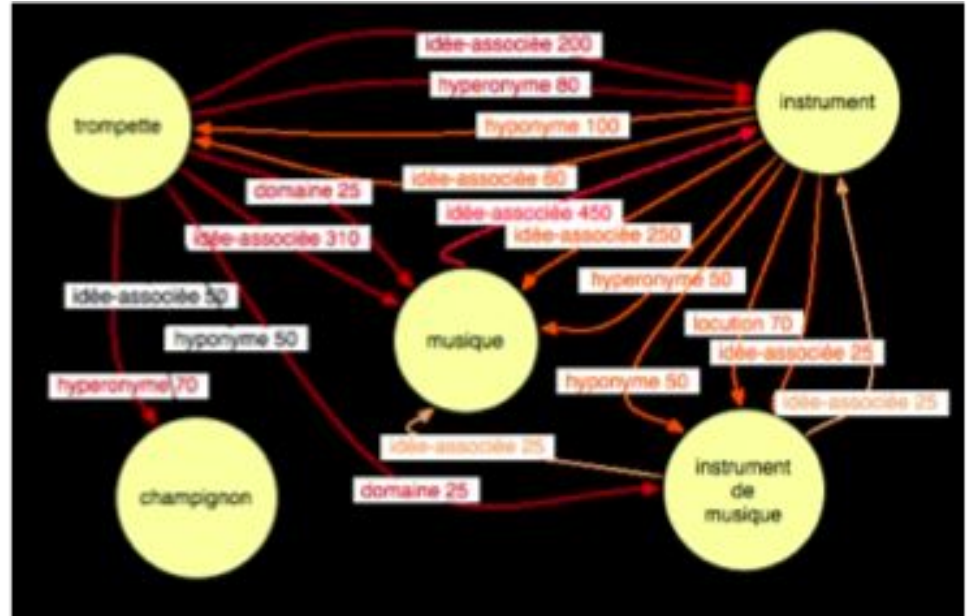
# Interest of the approach

- Reusing strong functions of many existing mind-mapping applications.
- Visualizations of ontologies for domain experts:
  - Customizable visualizations of ontologies by using expand/collapse functions.
  - Users can choose specific colors for each sub-domain knowledge to have easier observation.
- Saving time and human effort to build the ontology visualizations.






# Creating and Using lexical resources



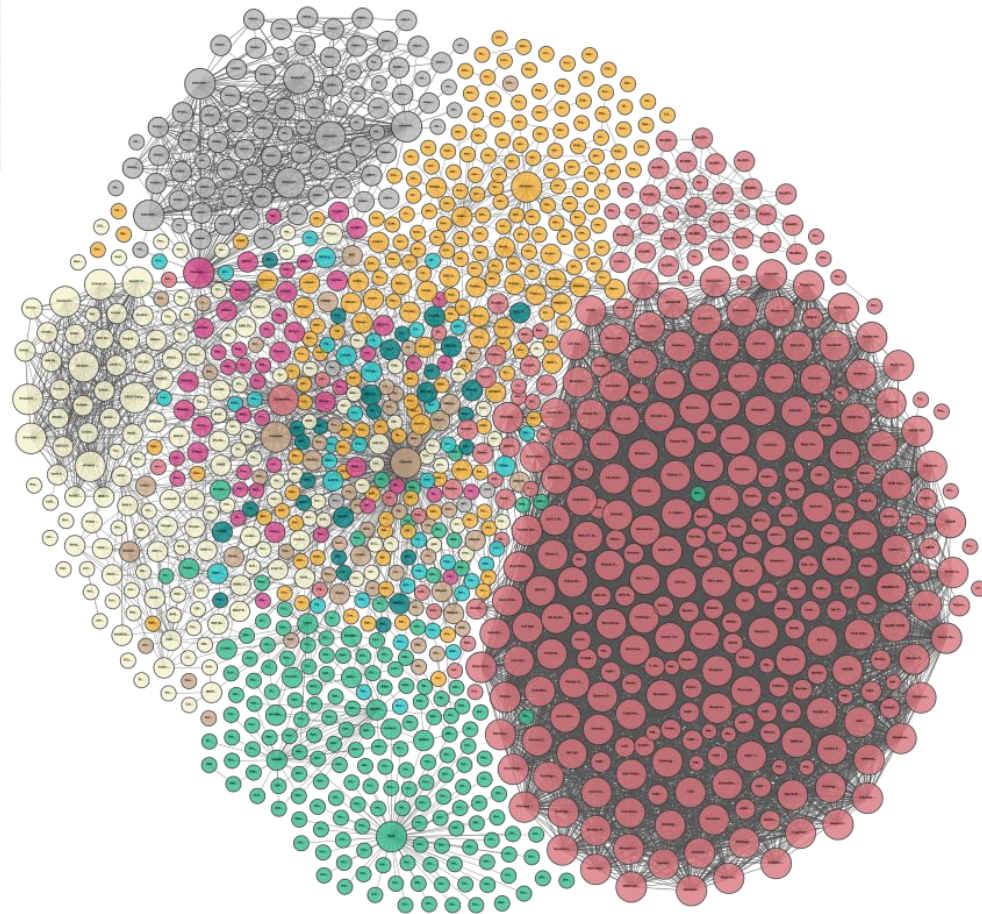
<http://www.jeuxdemots.org/>



# The reality... CEPS taxonomy

 <p><b>Interventions psychologiques santé</b></p>	 <p><b>Interventions physiques santé</b></p>	 <p><b>Interventions nutritionnelles santé</b></p>	 <p><b>Interventions numériques santé</b></p>	 <p><b>Autres interventions NM santé</b></p>
<p>Art Thérapie Education pour la santé Psychothérapie Zoothérapie</p>	<p>Activité physique Hortithérapie Physiothérapie Thérapie manuelle Thermalisme</p>	<p>Complément alimentaire Thérapie nutritionnelle</p>	<p>Objet connecté Thérapie par le jeu vidéo Thérapie par la réalité virtuelle</p>	<p>Objet ergonomique Phytothérapie Thérapie cosmétique Thérapie par les ondes Lithothérapie</p>

# Towards...



149,423,660,620 triples from **2973 datasets**

Linking Open Data cloud diagram 2017, by Andrejs Abele, John P. McCrae, Paul Buitelaar, Anja Jentzsch and Richard Cyganiak. <http://lod-cloud.net/>

# Thank you!

G rard Bourrel, Franois Carbonnel, Aur lie  
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Special thanks on ontology and lexical resources to  
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