pour la gestion des ontologies ?

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Définitions

- Gruber 1993

  Une ontologie est une spécification explicite d'une conceptualisation
- Borst 1997

  Une ontologie est une spécification formelle d'une conceptualisation partagée
- Studer, Benjamin et Fensel 1998

  Une ontologie est une spécification formelle et explicite d'une conceptualisation partagée

Définition adoptée

Une ontologie est une **spécification formelle** d'une **conceptualisation partagée**

Calculable par une machine

Connaissances partagées

Concepts, propriétés,, relations, explicitement définis

Modèle de la réalité

OutilConstruction

OutilVisualisation

aActivité(Outil, Activité)

estCompatible(Outil,Outil)

aIRI(

OutilConstruction(SWOOP)

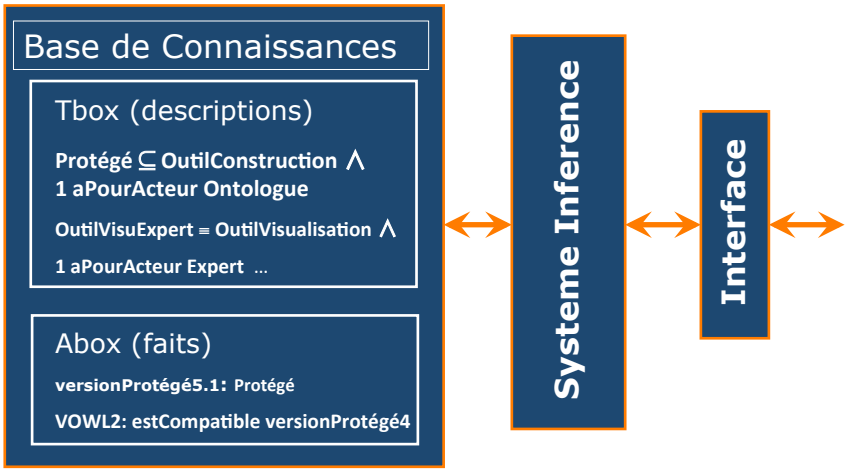
OutilVisualisation(VOWL)

estCompatible(VOWL2, VersionProtégé4)

a- réalité b- ontologie c- description

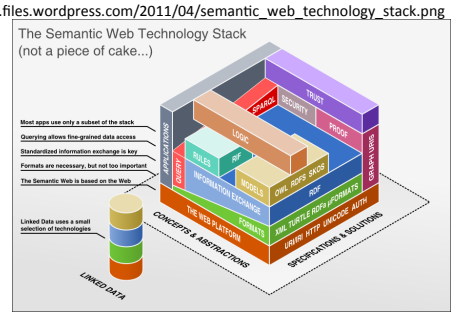
Et en logique de description …

D'après I. Horrocks "Description Logic Reasoning"



Et maintenant

https://baojiebaojie.files.wordpress.com/2011/04/semantic_web_technology_stack.png

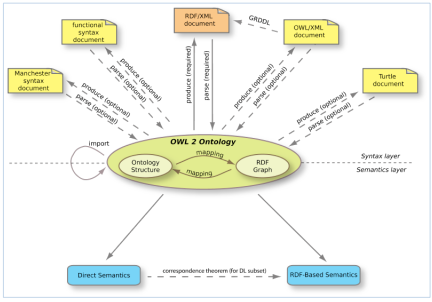


DL Expressivity

$\mathcal{ALCHO}(D)$

Symbol key

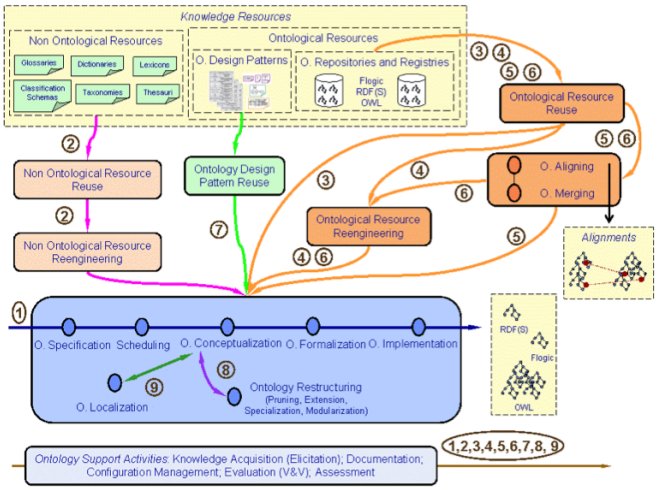
$\mathcal{AL}$	Attributive language. This is the base language which allows: ● Atomic negation (negation of concepts that do not appear on the left hand side of axioms) ● Concept intersection ● Universal restrictions ● Limited existential quantification (restrictions that only have fillers of Thing)
$\mathcal{FL}^-$	A sub-language of AL, which is obtained by disallowing atomic negation
$\mathcal{FL}_0$	A sub-language of FL^-, which is obtained by disallowing limited existential quantification
$\mathcal{C}$	Complex concept negation
$\mathcal{S}$	An abbreviation for AL and C with transitive properties
$\mathcal{H}$	Role hierarchy (subproperties – rdfs:subPropertyOf)
$\mathcal{O}$	Nominals. (Enumerated classes or object value restrictions – owl:oneOf, owl:hasValue)
$\mathcal{I}$	Inverse properties
$\mathcal{N}$	Cardinality restrictions (owl:Cardinality, owl:minCardianlity, owl:maxCardinality)
$\mathcal{Q}$	Qualified cardinality restrictions (available in OWL 1.1)
$\mathcal{F}$	Functional properties
$\mathcal{E}$	Full existential quantification (Existential restrictions that have fillers other that owl:Thing)
$\mathcal{U}$	Concept union
(D)	Use of datatype properties, data values or datatypes



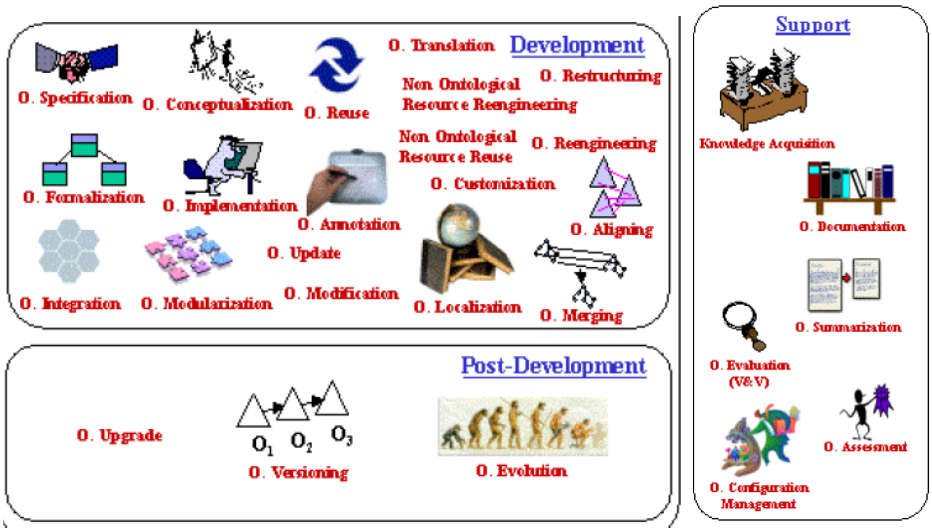
https://www.w3.org/TR/owl2-overview/

Méthodologie Neon

Suárez-Figueroa M.C., Gómez-Pérez A., Fernández-López M. (2012)



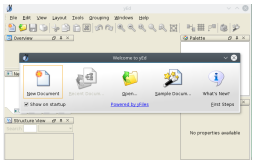
Activités afférentes la construction d'ontologies



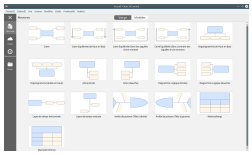
[d'après Gomez Perez]

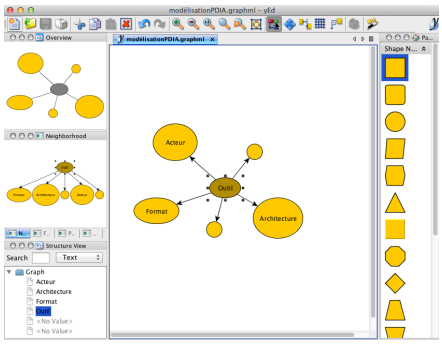
Outils de modélisation

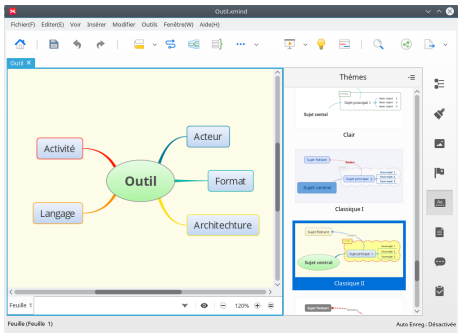
Yed



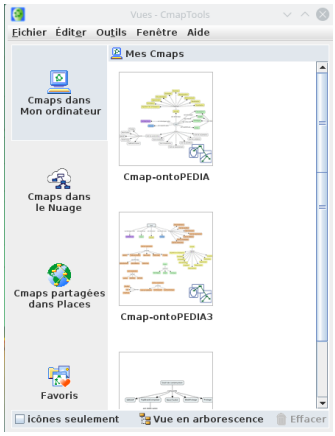
XMind

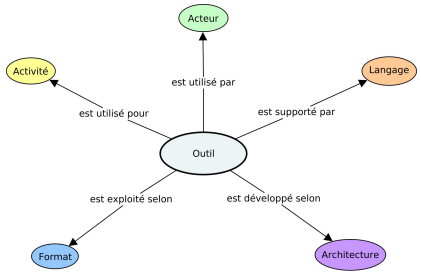


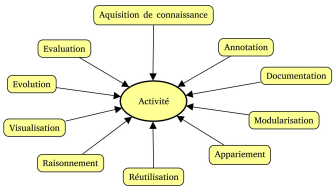


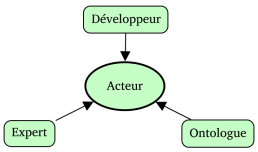


Outil sélectionné







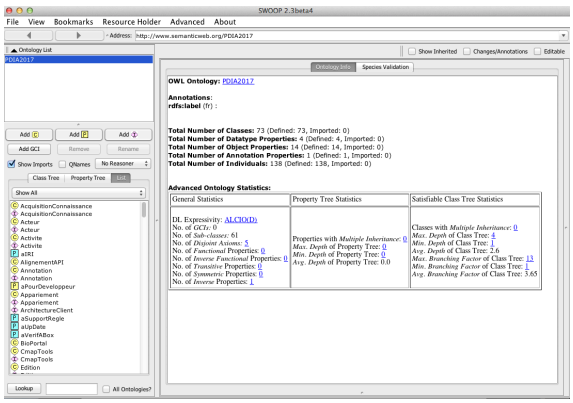


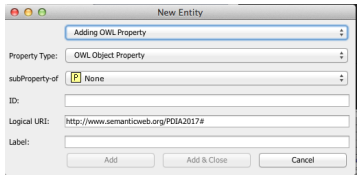
Modélisation

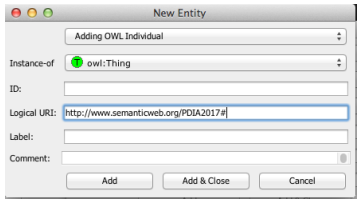
Outil de construction

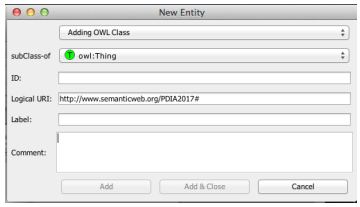
- https://www.w3.org/wiki/Ontology_editors
  - http://protege.stanford.edu/
  - http://neon-toolkit.org/
  - http://www.mindswap.org/2004/SWOOP/
  - http://www.topquadrant.com/products/TB_Composer.html

SWOOP 2.3 Beta 4

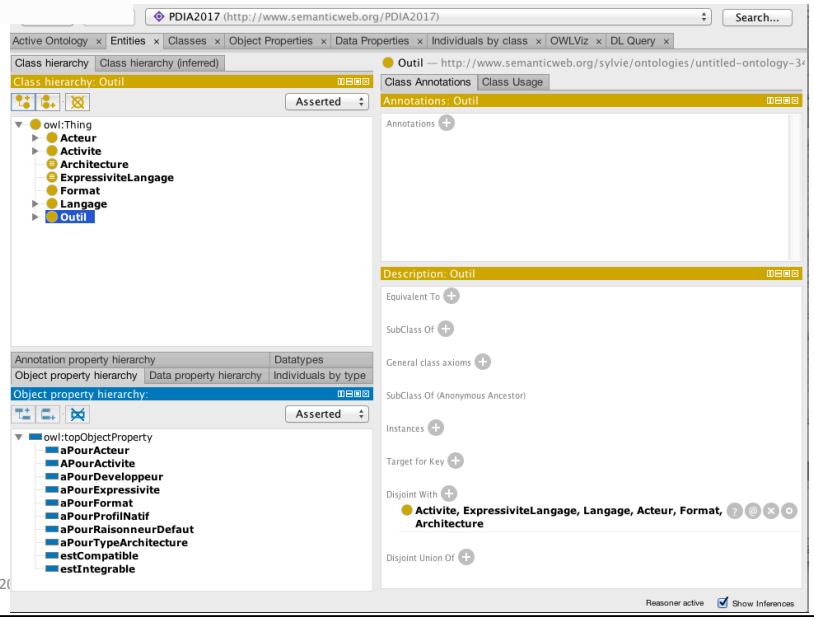








protégé Version 5.1



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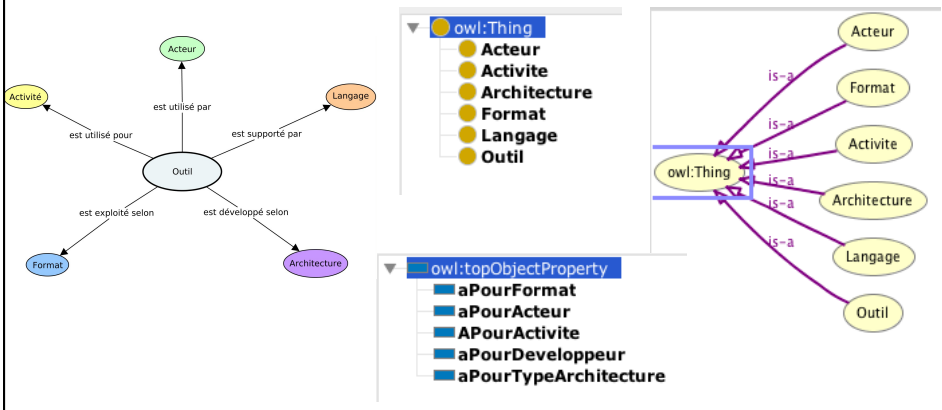
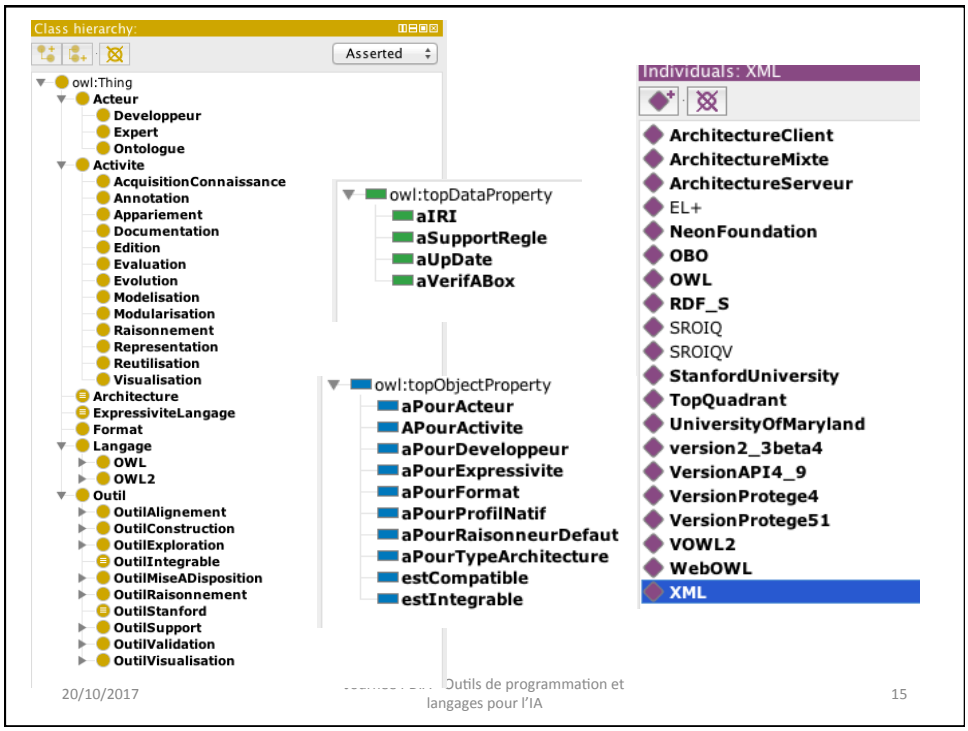
Modélisation -> Formalisation




Class hierarchy:
Asserted
owl:Thing
Acteur
Developpeur
Expert
Ontologue
Activite
AcquisitionConnaissance
Annotation
Appariement
Documentation
Edition
Evaluation
Evolution
Modelisation
Modularisation
Raisonnement
Representation
Reutilisation
Visualisation
Architecture
ExpressiviteLangage
Format
Langage
OWL
OWL2
Outil
OutilAlignement
OutilConstruction
OutilExploration
OutilIntegrable
OutilMiseADisposition
OutilRaisonnement
OutilStanford
OutilSupport
OutilValidation
OutilVisualisation
owl:topDataProperty
aIRI
aSupportRegle
aUpDate
aVerifABox
owl:topObjectProperty
aPourActeur
APourActivite
aPourDeveloppeur
aPourExpressivite
aPourFormat
aPourProfilNatif
aPourRaisonneurDefaut
aPourTypeArchitecture
estCompatible
estIntegrable
Individuals: XML
ArchitectureClient
ArchitectureMixte
ArchitectureServeur
EL+
NeonFoundation
OBO
OWL
RDF_S
SROIQ
SROIQV
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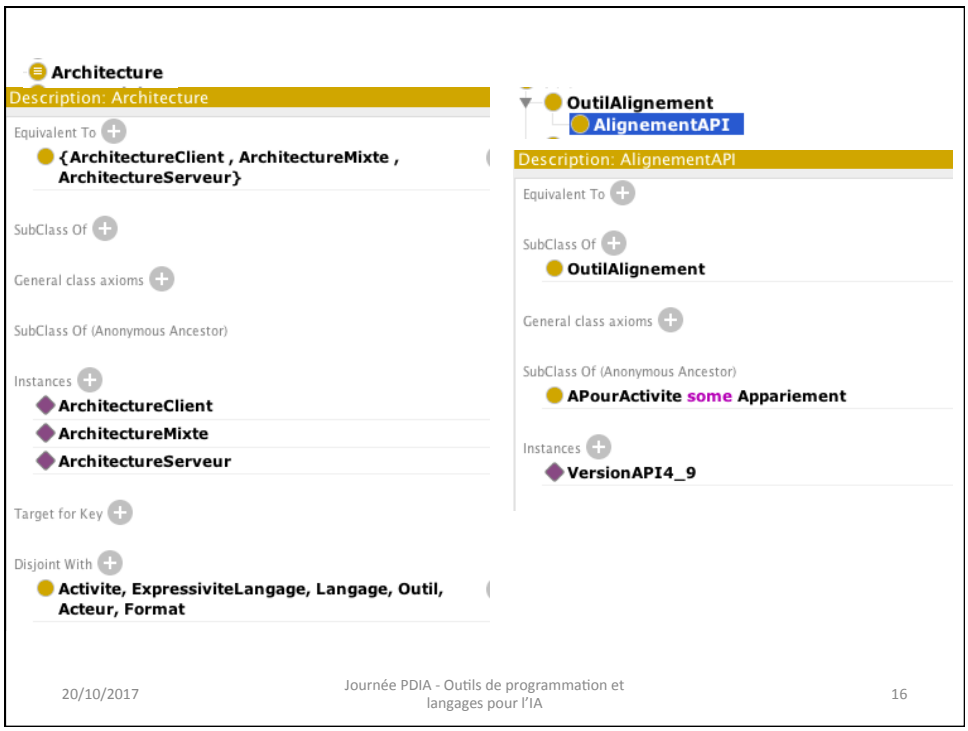
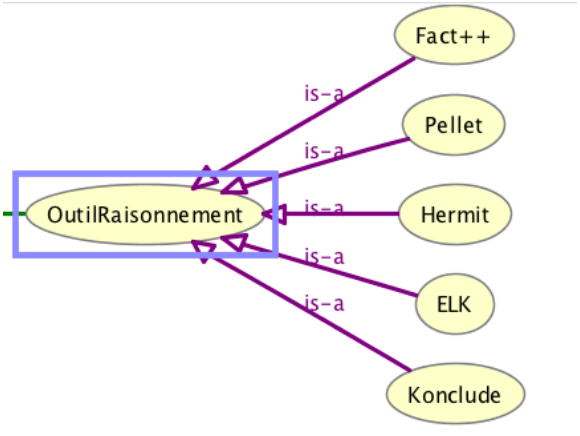
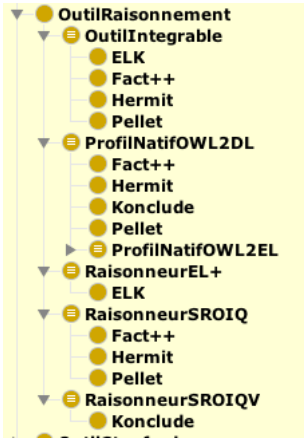
VersionProtege4
VersionProtege51
VOWL2
WebOWL
XML


Architecture
Description: Architecture
Equivalent To
{ArchitectureClient , ArchitectureMixte , ArchitectureServeur}
SubClass Of
General class axioms
SubClass Of (Anonymous Ancestor)
Instances
ArchitectureClient
ArchitectureMixte
ArchitectureServeur
Target for Key
Disjoint With
Activite, ExpressiviteLangage, Langage, Outil, Acteur, Format
OutilAlignement
AlignementAPI
Description: AlignementAPI
Equivalent To
SubClass Of
OutilAlignement
General class axioms
SubClass Of (Anonymous Ancestor)
APourActivite some Appariement
Instances
VersionAPI4_9

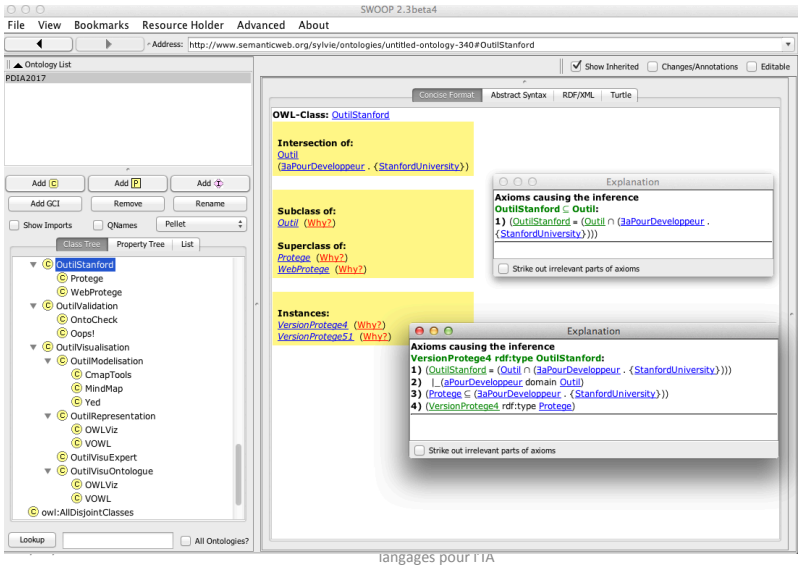
En OWL 2 …

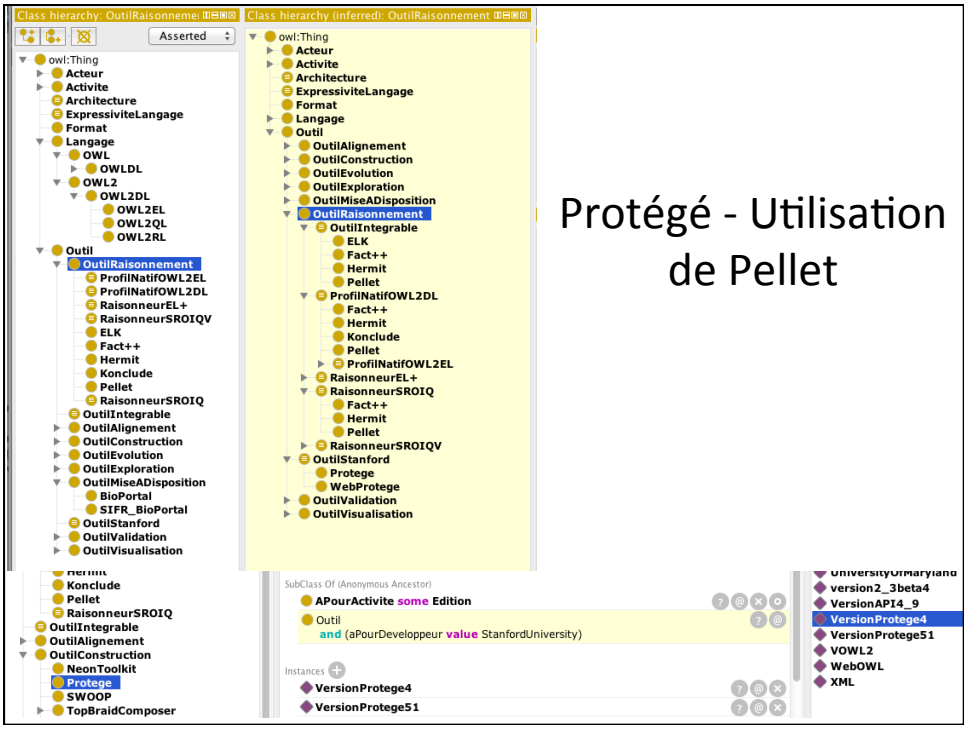
Outil de raisonnement





SWOOP - Utilisation de Pellet



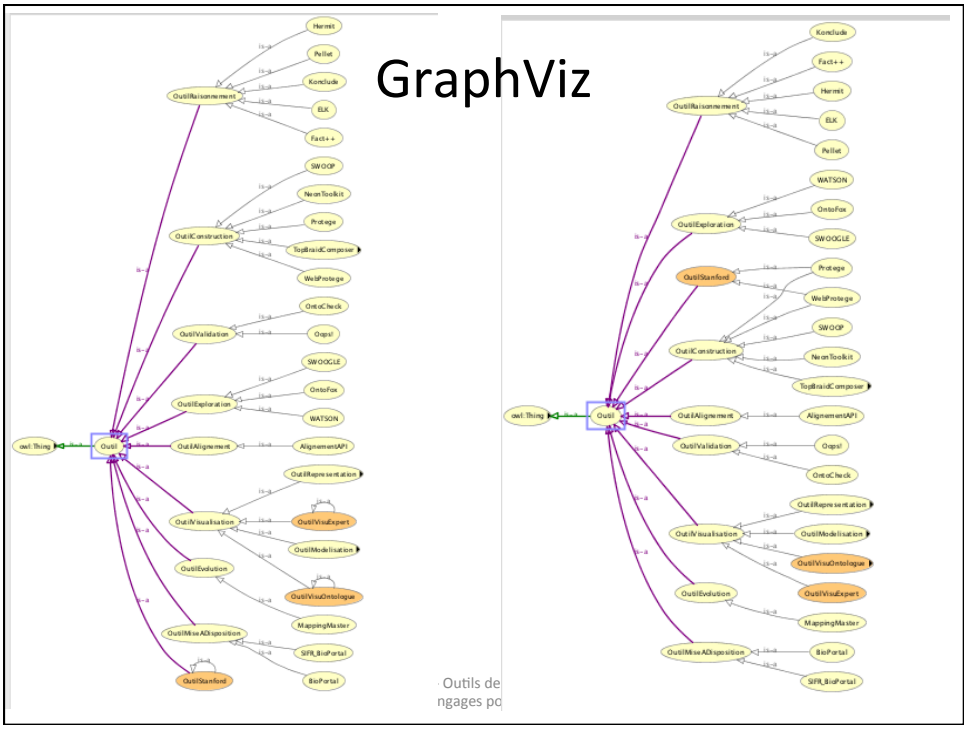


Protégé - Utilisation de Pellet

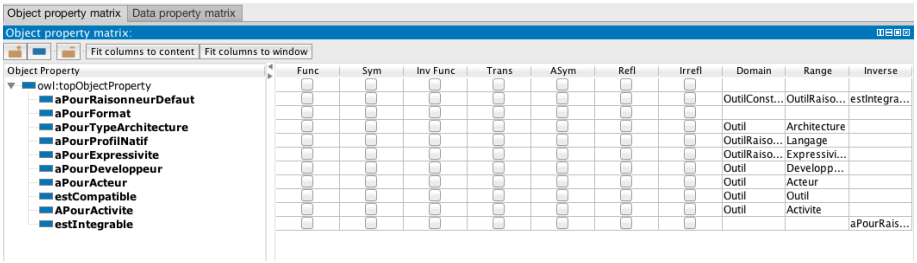
Visualisation d'ontologies

- GraphViz
  - Plugin éditeur
  - Dédié ontologue utilisable pour dialoguer avec l'expert
- WebVOWL
  - http://visualdataweb.de/webvowl/#ontovibe
  - Dédié ontologue

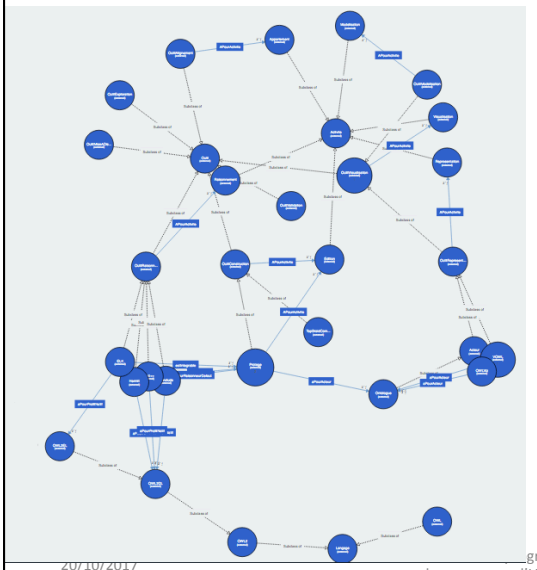
GraphViz

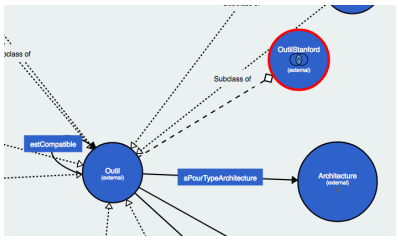


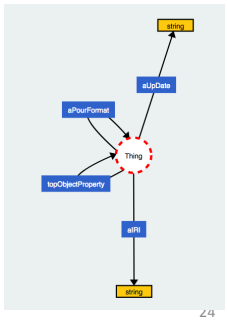
Property Matrix



WebVOWL 1.0.4

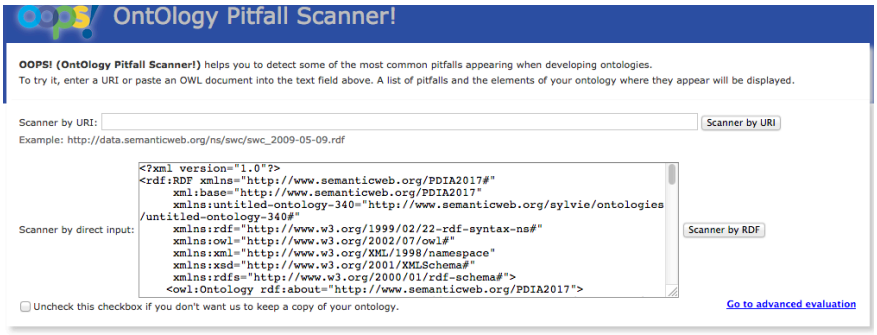




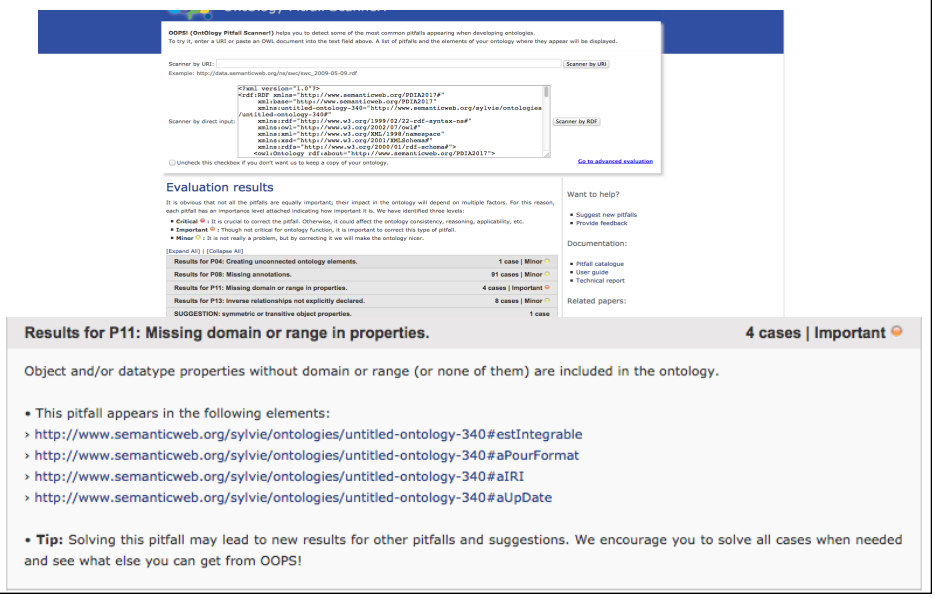


Outil de validation

- OOPS! - Ontology Pitfall Scanner !
  - Poveda-Villalón, M., Suárez-Figueroa, M. C., et Gómez-Pérez, A. (2012)
  - Outil indépendant de tout éditeur d'ontologies
  - Utilisation en ligne uniquement



Validation d'ontologies

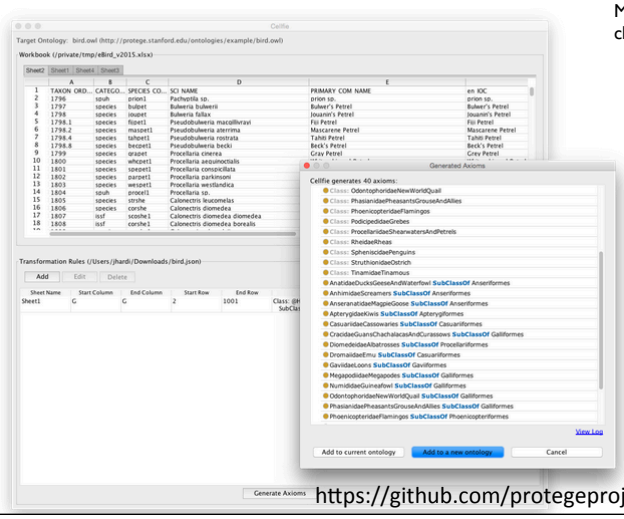


Outil d'exploration

- Ontofox ontofox.hegroup.org

Outil de support

A Protégé Desktop plugin for mapping spreadsheets to OWL ontologies.



Mapping Master

Plugin protégé Celfie

Points forts

- Pouvoir d'expression de la Manchester Syntax
- Bonne intégration dans Protégé

Points faibles

- Mapping à réaliser manuellement pour chaque feuille Excel
  - Modification de la feuille => Modification du mapping

https://github.com/protegeproject/cellfie-plugin

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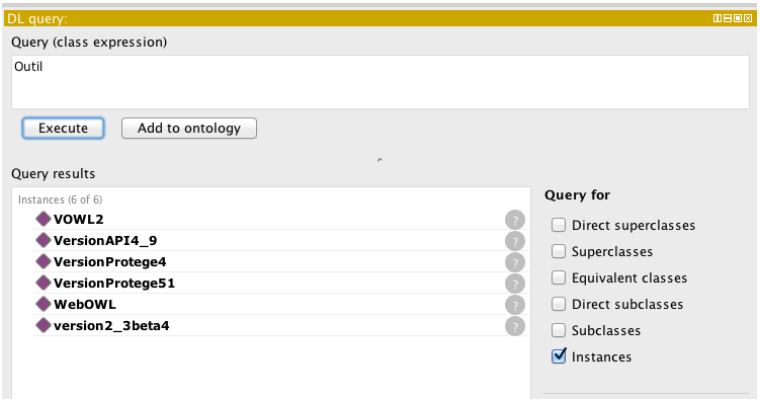
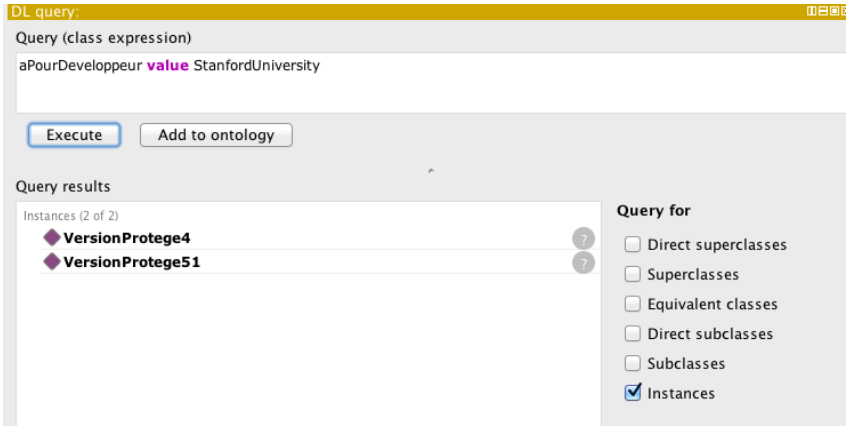
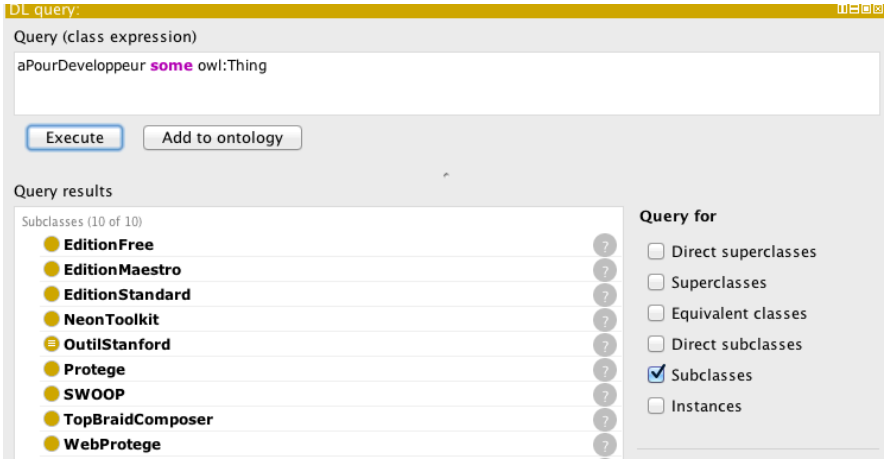
Interrogation DL Query de l'ontologie



Interrogation DL Query de l'ontologie



Interrogation DL Query de l'ontologie

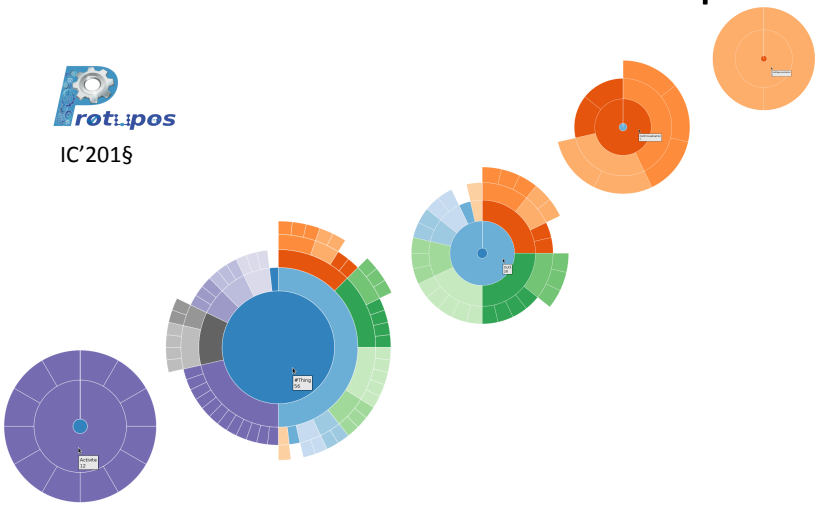


Parmi les accessoires manquants?

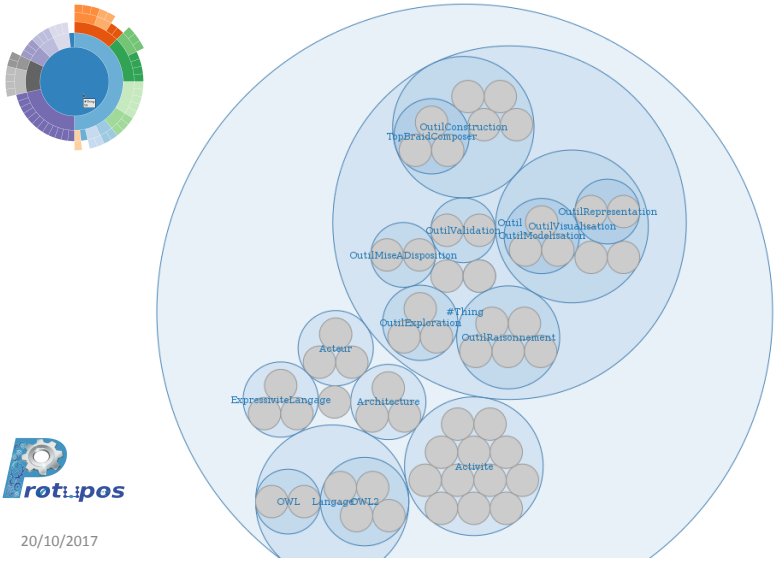
- Outil de visualisation dédié expert
- Outil supportant l'échange entre ontologue et utilisateur

Visualisation centrée expert

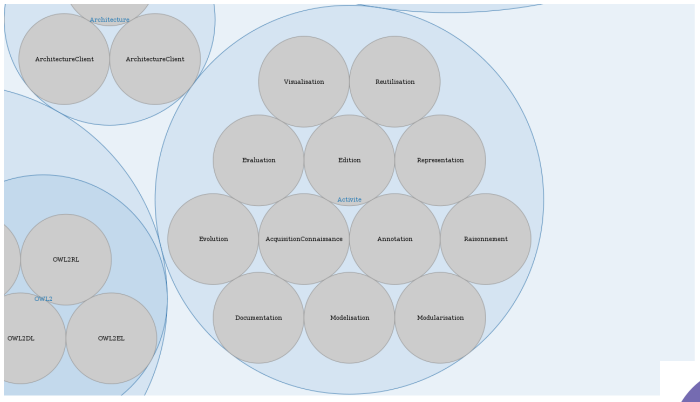
IC'201§

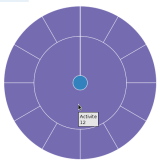


Visualisation centrée expert

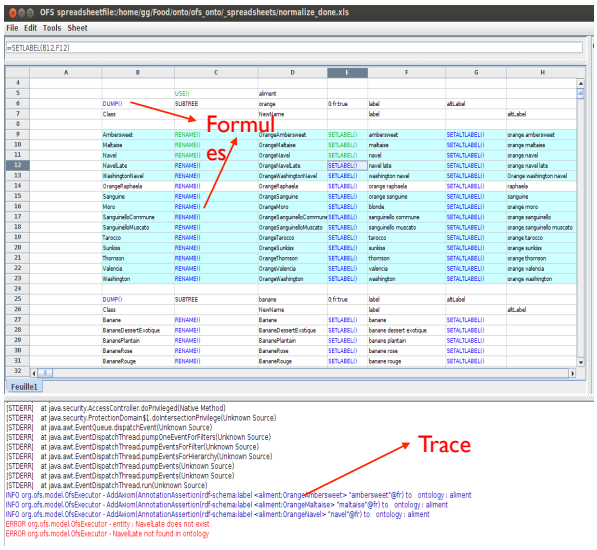


Visualisation centrée expert





Support échanges ontologue/expert



- Exécution interactive des formules
- Visualisation des axiomes produits avant validation
- Duplication et chaînage possible des formules
- Visualisation complète avant modification

FOE Flat Ontology Editor
Toth 2017

Merci

- Aux organisateurs de cette journée
  - qui ont permis la construction d'une petite ontologie des outils qui sans eux n'aurait jamais vu le jour
  - il reste à la compléter …
- A Rahma et Jérôme du LIMICS
  - pour leur contribution à la réalisation de ce travail

Références bibliographiques

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- Emhimed Alatrish - Comparison Some of Ontology Editors. In Management Information Systems, Vol. 8 (2013), No. 2, pp. 018-024
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- Suárez-Figueroa M.C., Gómez-Pérez A., Fernández-López M. (2012) The NeOn Methodology for Ontology Engineering. In: Suárez-Figueroa M., Gómez-Pérez A., Motta E., Gangemi A. (eds) Ontology Engineering in a Networked World. Springer, Berlin, Heidelberg