CIAD

Connaissance et Intelligence Artificielle Distribuées

Pauline Armary

Enrichissement d'Ontologie avec des règles SWRL partir de Texte pour la culture sous Serre

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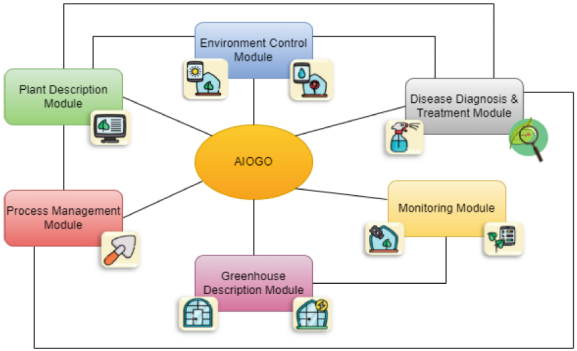
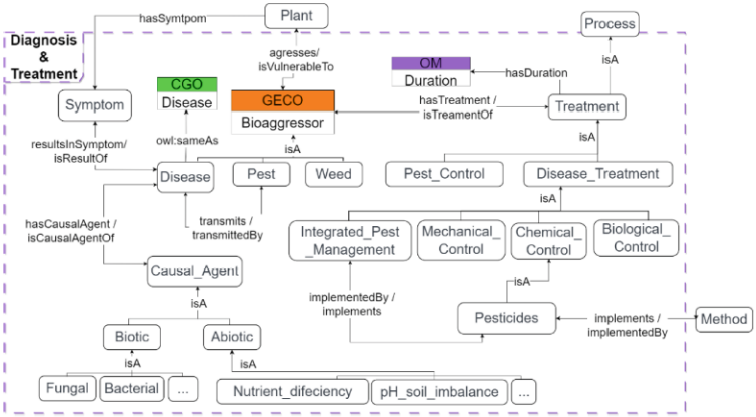
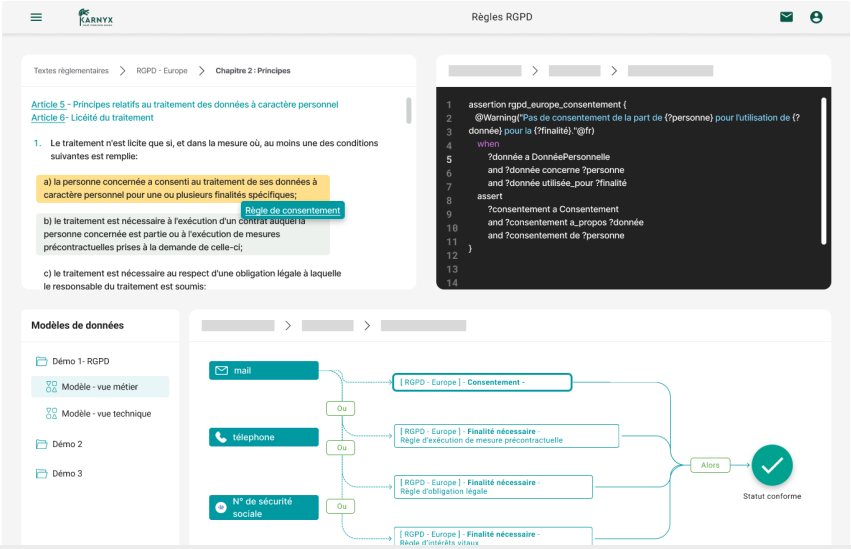
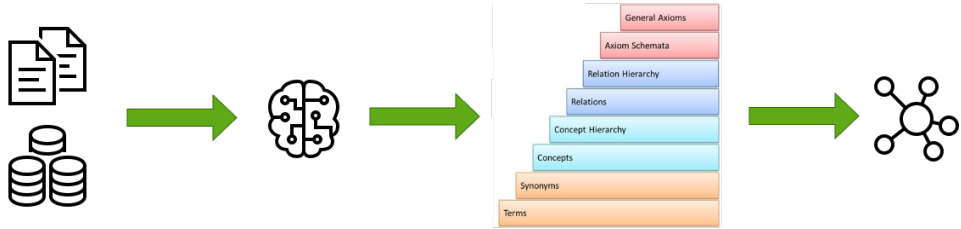


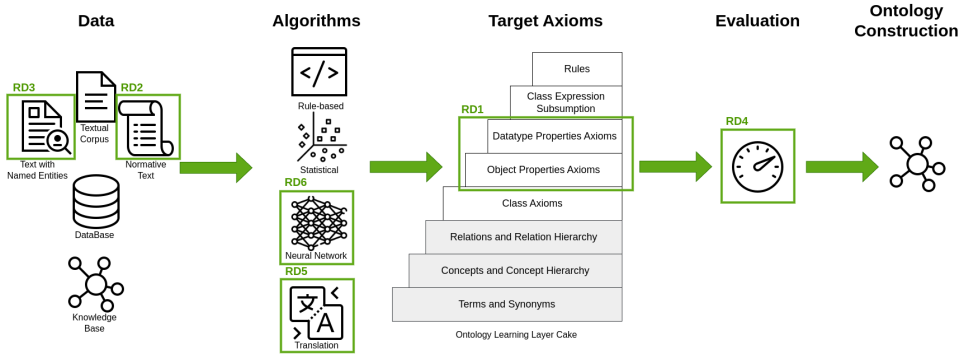
Fig. 1. AIOGO modular ontology

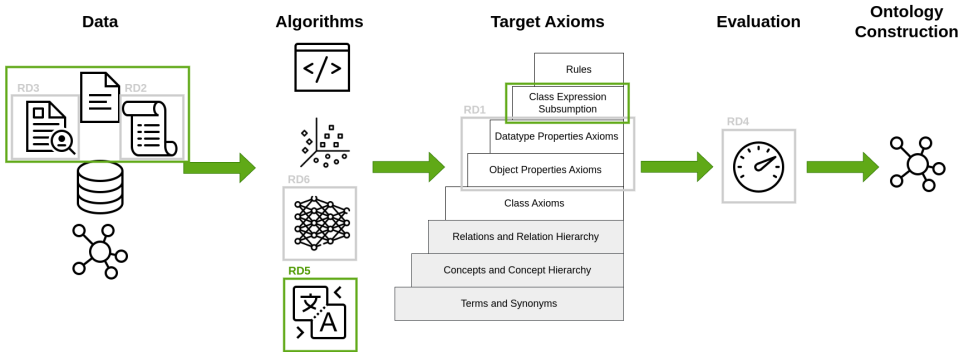
Ontology Objects	Number
Class	181
Object Property	93
Data Property	33
Individual	96
DL Expressivity	SHIF(D)


Diagnosis & Treatment
Plant
hasSymtpom
agresses/ isVulnerableTo
Process
isA
OM
Duration
hasDuration
CGO
Disease
GECO
Bioaggressor
hasTreatment / isTreamentOf
Treatment
Symptom
resultsInSymptom/ isResultOf
owl:sameAs
isA
isA
Disease
Pest
Weed
Pest_Control
Disease_Treatment
isA
hasCausalAgent / isCausalAgentOf
transmits / transmittedBy
Integrated_Pest _Management
Mechanical_ Control
Chemical_ Control
Biological_ Control
Causal_Agent
isA
implementedBy / implements
isA
Pesticides
implements / implementedBy
Method
Biotic
Abiotic
isA
isA
Fungal
Bacterial
...
Nutrient_dfeciency
pH_soil_imbalance
...


Règles RGPD
Textes règlementaires > RGPD - Europe > Chapitre 2 : Principes
Article 5 - Principes relatifs au traitement des données à caractère personnel
Article 6- Licéité du traitement
1. Le traitement n'est licite que si, et dans la mesure où, au moins une des conditions suivantes est remplie:
a) la personne concernée a consenti au traitement de ses données à caractère personnel pour une ou plusieurs finalités spécifiques;
Règle de consentement
b) le traitement est nécessaire à l'exécution d'un contrat auquel la personne concernée est partie ou à l'exécution de mesures précontractuelles prises à la demande de celle-ci;
c) le traitement est nécessaire au respect d'une obligation légale à laquelle le responsable du traitement est soumis:
assertion rgpd_europe_consentement {
@Warning("Pas de consentement de la part de {?personne} pour l'utilisation de {?donnée} pour la {?finalité}.")@fr)
when
?donnée a DonnéePersonnelle
and ?donnée concerne ?personne
and ?donnée utilisée_pour ?finalité
assert
?consentement a Consentement
and ?consentement a_propos ?donnée
and ?consentement de ?personne
}
Modèles de données
Démo 1- RGPD
Modèle - vue métier
Modèle - vue technique
Démo 2
Démo 3
mail
téléphone
N° de sécurité sociale
Ou
Ou
Ou
[RGPD - Europe] - Consentement -
[RGPD - Europe] - Finalité nécessaire - Règle d'exécution de mesure précontractuelle
[RGPD - Europe] - Finalité nécessaire - Règle d'obligation légale
[RGPD - Europe] - Finalité nécessaire - Règle d'intérêts vitaux
Alors
Statut conforme


General Axioms
Axiom Schemata
Relation Hierarchy
Relations
Concept Hierarchy
Concepts
Synonyms
Terms
Data
Learning Algorithm
OL Layer Cake
Ontology


Data
Algorithms
Target Axioms
Evaluation
Ontology Construction
RD3
RD2
Textual Corpus
Text with Named Entities
Normative Text
DataBase
Knowledge Base
Rule-based
Statistical
RD6
Neural Network
RD5
Translation
RD1
Rules
Class Expression Subsumption
Datatype Properties Axioms
Object Properties Axioms
Class Axioms
Relations and Relation Hierarchy
Concepts and Concept Hierarchy
Terms and Synonyms
Ontology Learning Layer Cake
RD4


Data
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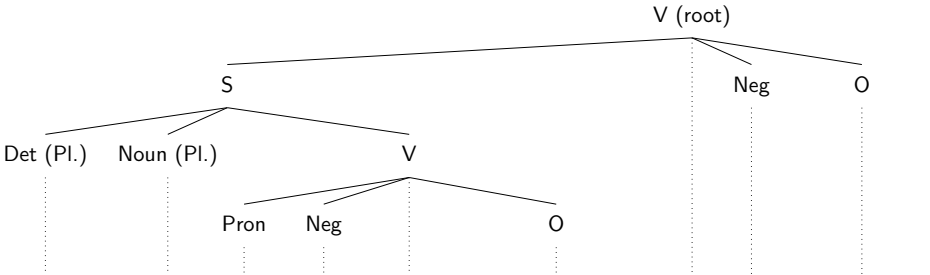

Figure: $\forall x[(Plate(x) \wedge \neg BeginWith(x, number34)) \rightarrow \neg BeFrom(x, Istanbul)]$

Sir Timothy John Berners-Lee PERSON (born 8 June 1955 DATE), also known as TimBL PERSON , is an English NORP computer scientist best known as the inventor of the World Wide Web PRODUCT , the HTML markup language, the URL system, and HTTP. He is a professorial research fellow at the University of Oxford ORG and a professor emeritus at the Massachusetts Institute of Technology ORG (MIT ORG). Berners-Lee PERSON was born in London GPE on 8 June 1955 DATE , the son of mathematicians and computer scientists Mary Lee Woods PERSON (1924–2017) and Conway Berners-Lee PERSON (1921–2019). His parents were both from Birmingham GPE and worked on the Ferranti Mark 1 PRODUCT , the first ORDINAL commercially-built computer. He has three CARDINAL younger siblings; his brother, Mike PERSON , is a professor of ecology and climate change management.

- If the children through the ball too far, they will loose it.

Grammatical Patterns	FOL translation	Axioms
S V O	$S(x) \wedge O(y) \wedge v(x,y)$	Conjunction
S NEG V O	$S(x) \wedge O(y) \wedge \neg v(x,y)$	Negation
S_1 [and] S_2 V O	$[S_1(x) \wedge O(y_1) \wedge v(x,y_1)] \wedge [S_2(z) \wedge O(y_2) \wedge v(z,y_2)]$	Conjunction
S_1 [or] S_2 V O	$[S_1(x) \wedge O(y_1) \wedge v(x,y_1)] \vee [S_2(z) \wedge O(y_2) \wedge v(z,y_2)]$	Disjunction
Noun [which/that] V O	$\exists y[N(x) \wedge O(y) \wedge v(x,y)]$	Class expression with Ex. restriction
S V Attr	$S(x) \rightarrow A(x)$	Concept Inclusion
IF S V_1 O_1, S V_2 O_2	$[S(x) \wedge O_1(y) \wedge v_1(x,y)] \rightarrow [O_2(z) \wedge v_2(x,z)]$	General Concept Inclusion
S[Plural] V O	$\forall x[S(x) \rightarrow (O(y) \wedge v(x,y))]$	Universal restriction
S[NE] V O[NE]	$v(\alpha, \beta)$	Relation assertion
S[NE] V Attr	$A(\alpha)$	Concept Assertion

Figure: MyFood Wiki Website: https://wiki.myfood.eu/docs/getting-started

Sentence	Summer vegetables should be grown in the Zipgrow tower.
SWRL Translation	summer-vegetable(?x) → grow-in(?x, theZipgrowtower)
Attempto CNL	If a summer-vegetable X, then X grow-in theZipgrowtower

Table: Rules Translation

Sentence	Here's a summary of the quantities, frequencies, and methods for adding them depending on the season.
SWRL Translation	summary-of-for(?y) & be-here(?y)
Attempto CNL	a summary-of-for Y and a be-here Y

Table: Non-Rule Translation

	Initial Onto.	New Onto.
Classes	98	356
Object Prop.	85	329
Rules	0	240

	Rules	Non Rules (base)
Number	240	515
BLEU	2.41	2.09
ROUGE	**44.99**	23.27

- Main Results and Contribution
  - Application of an neuro-symbolic method for extracting rule in the agriculture domain
  - New methodology for evaluating the extraction and translation in the absence of a Gold Standard with the use of Controlled Natural Language (CNL) and translation metrics

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  - Application of an neuro-symbolic method for extracting rule in the agriculture domain
  - New methodology for evaluating the extraction and translation in the absence of a Gold Standard with the use of Controlled Natural Language (CNL) and translation metrics
- Future Directions
  - Integrate grammatical patterns, to capture further information like numerical information (measures, numbers), imperative verbs
  - Explore the capacities of upper and mid-level ontologies to provide frameworks for translating complex grammatical structure (verbs with 2 complements)
  - Evaluate the coherence of the rules and concepts extracted to increase the inference capacity of the system

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Thank you

Appendix