



University of Rome “Tor Vergata”

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# ***Una success story* tra Accademia ed Istituzioni Pubbliche**

...

***in 5 minuti !***

**Maria Teresa PAZIENZA, Armando STELLATO,**

**Manuel Fiorelli, Tiziano Lorenzetti, Andrea Turbati,**

..... <http://art.uniroma2.it/>

Roma, ELRC, 15 marzo 2016

# Il nostro laboratorio di ricerca



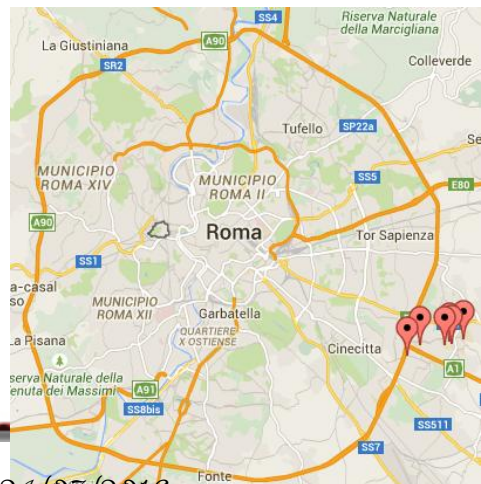
Università degli Studi di Roma Tor Vergata



<http://web.uniroma2.it/>

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- Realized as a University Campus distributed over a wide area in the SE of Rome



24/03/2016

# The ART Group



[Prof. Maria Teresa Pazienza](#)

Full Professor, head of the ART group



[Prof. Roberto Basili](#)

Associate Professor



[Prof. Fabio Massimo Zanzotto](#)

Associate Professor



[Armando Stellato](#)

Researcher

## Associates

(PhD students, research associates/fellows/assistants...)



[Paolo Annesi](#)

M.S., PhD Student



[Danilo Croce](#)

Eng., M.S., PhD Student



[Diego De Cao](#)

Eng., M.S., PhD



[Manuel Fiorelli](#)

M.S., PhD student



[Cristina Giannone](#)

Eng., M.S., PhD



[Andrea Turbati](#)

Eng., M.S., PhD

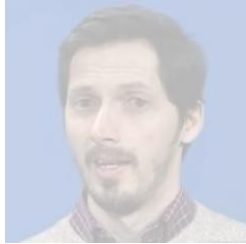
A R T  
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## Areas of Interest

### Natural Language Processing

- Robust Parsing
- Information Extraction
- Semantic Role Labeling
- Textual Entailment
- ML for Natural Language



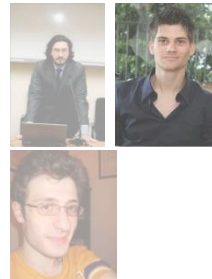
### Machine Learning

- ML for Natural Language
- Computational Language Learning
- Ontology Learning
- Classification, Multimedia IR
- Music IR



### Knowledge Engineering

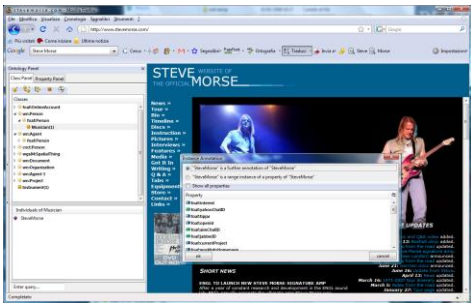
- Ontologies and Knowledge Modeling
- Semantic Web Technologies
- Knowledge Acquisition
- Knowledge Sharing
- Knowledge-based Systems



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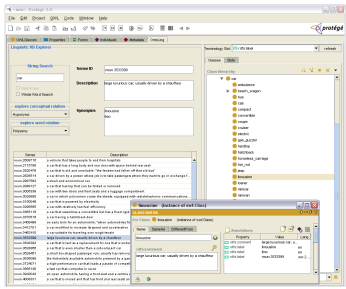
# ART Technology Asset (KE Unit)

Semantic Turkey / VocBench\*



Flagship KM&A Platform

OntoLing



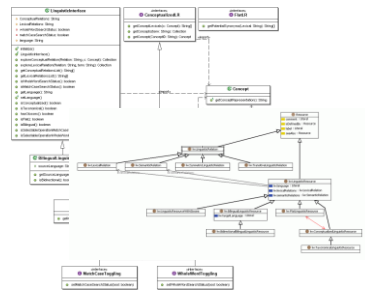
Ontology Linguistic Enrichment Tool

ALE



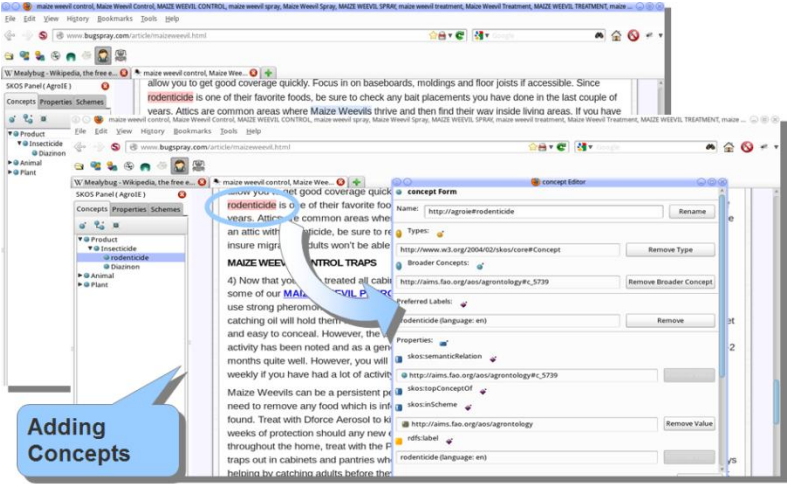
Automatic Linguistic Enrichment

Linguistic Watermark



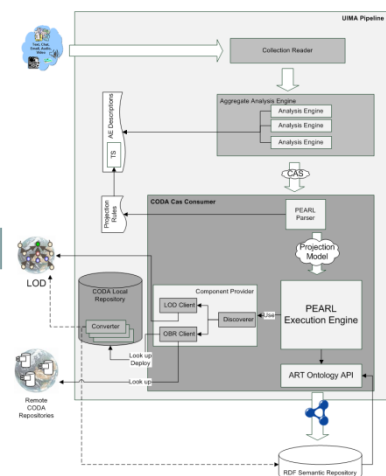
Library and Ontologies for Accessing Heterogeneous Linguistic Resources

Semantic Turkey extensions for Knowledge Acquisition



Adding Concepts

CODA



Computer-aided Ontology Development Architecture

Wrappers for different LRs

JMWNL  
Java Multi WordNet Library



\* Vocbench In collaboration with FAO

# ART Technology Asset (KE Unit) (2)

*The ART Group is actively contributing to both the research and end users communities with the software outcomes of its applied research*

## Knowledge Management and Acquisition

Semantic Turkey: a Knowledge Management and Acquisition Platform for the Semantic Web

VocBench: a collaborative editing environment for SKOS thesauri and concept schemes (developed in collaboration with FAO)

CODA: an architecture used to project the data produced by one or more UIMA annotators onto an ontology

Sheet2RDF: a platform for acquisition and transformation of datasheets into RDF (also available as a Semantic Turkey plugin, and soon for VocBench as well)

OntoLing: a tool for Linguistic Enrichment of ontologies (*available as extension for different ontology development platforms*)

Owl ART API: api for accessing and managing RDF. Provide various implementations for several existing triple store

## Natural Language Processing / Language Engineering

The Chaos System: A Natural Language Robust Processor

OBI-WAN: Ontology Based WrApper iNduction

Linguistic Watermark: an abstraction framework for uniformly accessing heterogeneous linguistic resources (thesauri, dictionaries, wordnets...):

JMWNL: Java (Multi)WordNet Library: a set of extensions to the JWNL library allowing access to WordNets for different languages (currently supports EuroWordNet)

LIME: a vocabulary and an associated Java API for linguistic metadata about linguistically grounded RDF datasets and linguistic resources published as Linked Data

*2006 In una  
conferenza lontana lontana...  
incontriamo alcuni rappresentanti della FAO  
si parla di tesauri, risorse online,  
multilinguismo...*

# Interesse per nostre risorse per arricchimento linguistico

The screenshot shows the Protégé 3.1 interface with a 'Current Frame: 'Series'' window open. The window displays a table of senses for the word 'series' with columns for Sense, Gloss, and Plausibility. The sense 'noun.7363563 (sports) several contests played successively by t...' is highlighted. The interface also shows a 'Linguistic KB Explorer' on the left with a search for 'series' and a 'Series' class selected in the right-hand pane.

Sense	Gloss	Plausibility
noun.8342833	similar things placed in order or happening one ...	0.407492...
noun.6533268	a serialized set of programs; "a comedy series"; ...	0.285714
noun.6506224	a periodical that appears at scheduled times	0.368783...
noun.7363563	(sports) several contests played successively by t...	0.784858...
noun.8343343	a group of postage stamps having a common th...	0.530959...
noun.5788788	(mathematics) the sum of a finite or infinite seq...	0.285714
noun.13610816	(electronics) connection of components in such...	0.424601...

Sense	Description
noun.7945291	similar things placed in order or happening one after another; "they were investigating ...
noun.6212411	a serialized set of programs; "a comedy series"; "the Masterworks concert series"
noun.6187084	a periodical that appears at scheduled times
noun.7009269	(sports) several contests played successively by the same teams; "the visiting team swep...

- Season
- Series
  - ChampionshipSeries
  - WorldSeries
- Stadium
- Team



Protégé 3.0

File Edit Project OWL Code Window Help

OWLClasses Properties Forms Individuals Metadata OntoLing

Linguistic KB Explorer

String Search

car

MatchCase

Whole Word Search

explore conceptual relation

Hyponyms

Hypernyms

Antonyms

Polysemy

Polysemy\_NOUN

Polysemy\_VERB

Polysemy\_ADJECTIVE

Polysemy\_ADVERB

Sense ID

ndun.3533399

Description

large luxurious car; usually driven by a chauffeur

Synonyms

limousine

limo

...and linguistic relationships

Integration between ontology and linguistic resource: search ontology terms inside the linguistic resource

Linguistic Enrichment of the Ontology

Assist ontology creation by extracting portions of knowledge from the LR

Concepts documented in LR

Search linguistic expressions inside the LR

Explore semantic relationships which characterize the LR

Ontology concepts bear a greater linguistic expressivity: this helps in identifying similarities with other conceptualizations.

Terminology Slot: rdfs:label refresh

Classes Slots

Class Hierarchy

- car
  - ambulance
  - beach\_wagon
  - bus

Create Class

Create Subclass Using Metaclass...

Delete Class

Change Metaclass...

Change Metaclass of Subclasses...

Hide Class

Set as Default Metaclass

Set as Default Metastot

Expand

limousine (instance of owl:Class)

CLASS EDITOR

For Class: limousine (instance of owl:Class)

differentFrom

rdfs:comment	large luxurious car; u...
rdfs:label	limousine en
rdfs:label	limo en
rdfs:label	noun.3533399 wn-2....

# Attività e Collaborazioni

2009: collaborazione allo sviluppo di VocBench, un sistema collaborativo, interno alla FAO, per lo sviluppo di tesauri multilingui

2009: collaborazione allo sviluppo di **Agrovoc** come tesoro SKOS/SKOSXL e alla sua pubblicazione come Linked Open Dataset. Ultima release **Agrovoc** : gennaio 2016

2012: inizio di una stretta collaborazione per il progetto VocBench 2.0. Un sistema general purpose completamente compliant agli standard W3C SKOS/SKOSXL per la rappresentazione di tesauri, basato su Semantic Turkey - framework per la gestione di ontologie, tesauri e dati RDF- sviluppato a Tor Vergata

2012: progetto europeo SemaGrow, per lo sviluppo di tecnologie a supporto di federazioni di linked data partners. Supporto parziale allo sviluppo di VocBench 2

2016: .....

# <http://aims.fao.org/vest-registry/vocabularies/agrovoc-multilingual-agricultural-thesaurus>

AGROVOC is a ***controlled vocabulary*** covering all areas of interest of the Food and Agriculture Organization ([FAO](#)) of the United Nations. It is published by FAO and edited by a community of experts.

AGROVOC consists of over **32,000 concepts available in 23 languages**: Arabic, Chinese, Czech, English, French, German, Hindi, Hungarian, Italian, Japanese, Korean, Lao, Malay, Persian, Polish, Portuguese, Russian, Slovak, Spanish, Telugu, Thai, Turkish and Ukrainian.

You can use AGROVOC to look up the common name of a plant in a language that you do not master, or to find relations between a commodity and the crop from which it is produced. Your library can use AGROVOC to index its documents, or you can use it from inside your content management system (e.g., Drupal) to organize your documents or web site. You can also use AGROVOC as an hub to access many other vocabularies available on the web.

To date, AGROVOC is used by researchers, librarians and information managers for indexing, retrieving and organizing data in agricultural information systems and Web pages. Currently, AGROVOC is an SKOS-XL concept scheme and a Linked Open Data (LOD) set aligned with 16 other multilingual knowledge organization systems related to agriculture.

You may download AGROVOC, access its Web Services or SPARQL endpoint.

# Agrovoc Oggi (1)

- Agrovoc [1]: Linked Open Dataset a 5 stelle
  - SKOS & SKOSXL
  - > 32.000 concetti
  - sviluppato collaborativamente a livello mondiale (tramite VocBench 2) e validato da FAO
- Disponibile:
  - tramite HTTP dereferenciation (dati RDF o pagine Web)
  - tramite SPARQL endpoint ()
- Metadati
  - descritto da una ontologia: <http://aims.fao.org/aos/agrontology.owl>
  - VOID description: <http://aims.fao.org/aos/agrovoc/void.ttl>
  - presto anche LIME description
- **Multilingue**
  - 25 lingue (22 fortemente rappresentate, 3 in via di sviluppo)

# Agrovoc Oggi (2)

- **Uso**

- utilizzato come vocabolario per l'indicizzazione di basi documentali
- come riferimento per dimensioni discrete in ipercubi per dati statistici
- repository più noto basato su Agrovoc: AGRIS [1]
  - data agglomeration da 150 provider, provenienti da 100 diversi paesi
  - 5 milioni di riferimenti bibliografici in ambito agricolo, più di 130 milioni di triple RDF
  - spidered da google per popolare Google Scholar

- **Dissemination**

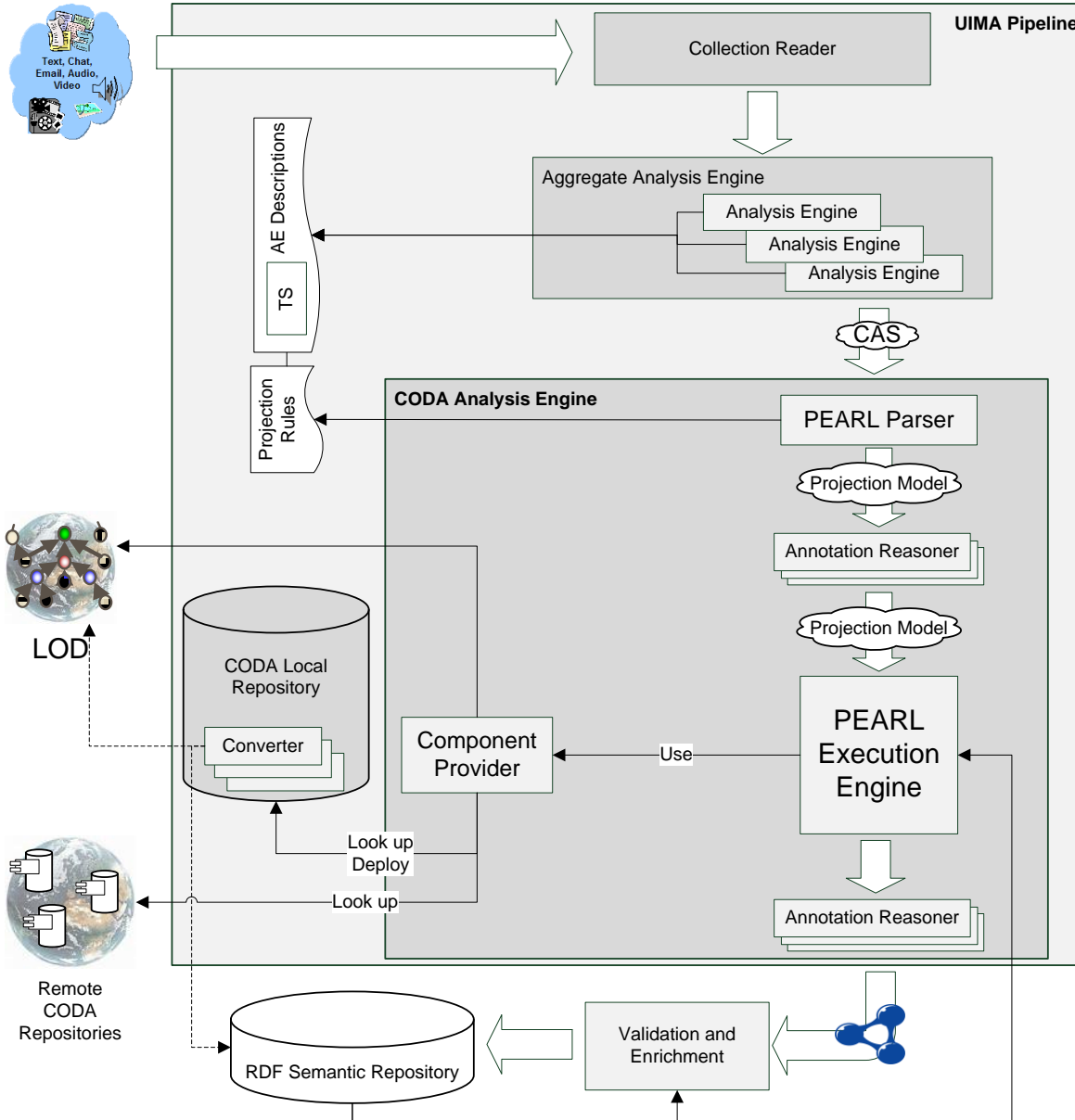
- AIMS (Agriculture Information Management Standard): <http://aims.fao.org>
- dataset description sul Semantic Web Journal maggiormente citata [2]

[1] Stefano Anibaldi, Yves Jaques, Fabrizio Celli, Armando Stellato and Johannes Keizer **Migrating bibliographic datasets to the Semantic Web: The AGRIS case, Semantic Web**, doi:10.3233/SW-130128, **6, 2, 113-120**, IOS Press, 2015

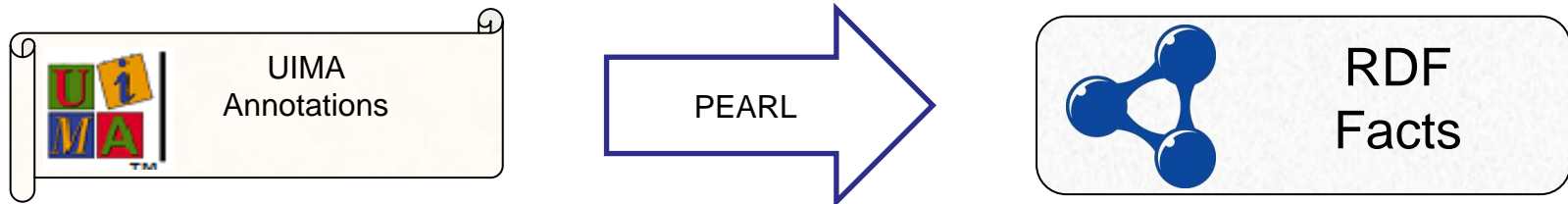
[2] Hogan, Aidan; Hitzler, Pascal; Janowicz, Krzysztof. **Linked Dataset description papers at the Semantic Web journal: A critical assessment; Semantic Web Journal**, vol. 7, no. 2, pp. 105-116, 2016

- **COD** (Computer-aided Ontology Development)
  - All processes for enriching ontology content through exploitation of external resources, by using (semi)automatic approaches.
- **CODA: COD Architecture**
  - An Architecture for systems for Computer-aided Ontology Development
  - A Platform supporting development of such systems

# CODA



- ProjEction of Annotations Rule Language
- A language for transforming information extracted and stored as UIMA annotations into RDF Triples

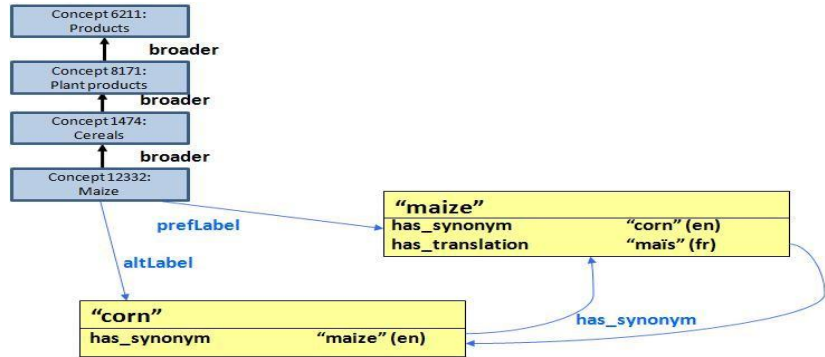




# A use case for CODA: AGROVOC



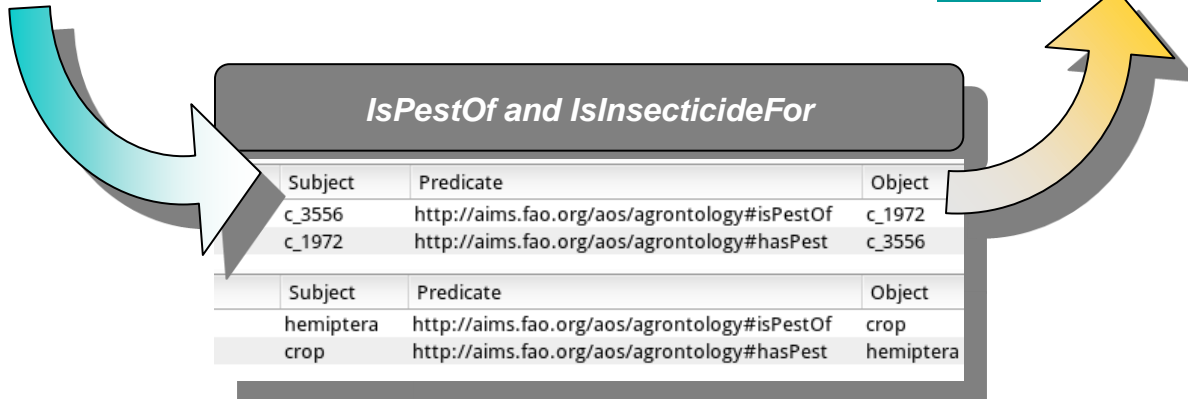
Natural Language Documents



## AGROVOC SKOS

<http://aims.fao.org/standards/agrovoc/concept-scheme>

Documents



# Automatic Annotation and Knowledge Acquisition

Semantic Turkey

AgroIE plugin

Insects

Plants

Relations

AGROVOC Thesaurus  
(Small cut)

en.wikipedia.org/wiki/Maize weevil - Mozilla Firefox

W Maize weevil - Wikipedia, the free e...

SKOS Panel (AgroIE)

Concepts Properties Schemes

- Product
  - Insecticide
    - Diazinon
- Animal
  - Insect
    - Curculionidae
      - Pseudococcidae
- Plant
  - Cassava
  - Cereal
    - Rise
    - Oryza
    - Rye
    - Sorghum
    - Oat
    - Wheat
    - Barley
    - Buckwheat
  - Orchidacea
  - Fruit
    - Grape
    - Papaya
  - Comosus

WIKIPEDIA  
The Free Encyclopedia

Navigation

- Main page
- Contents
- Featured content
- Current events
- Random article
- Donate to Wikipedia

Interaction

- Help
- About Wikipedia
- Community portal
- Recent changes
- Contact Wikipedia

Toolbox

What links here

Recent changes

Article Talk

Read Edit View history

## Maize weevil

From Wikipedia, the free encyclopedia

The **maize weevil** (*Sitophilus zeamais*), known in the **United States** as the **greater rice weevil**,<sup>[1][2]</sup> is a species of **beetle** in the family **Curculionidae**. It can be found in numerous tropical areas around the world, and in the United States, and is a major **pest** of **maize**.<sup>[3]</sup> This **species attacks both standing crops and stored cereal products, including wheat, rice, sorghum, oats, barley, rye, buckwheat, peas, and cottonseed**. The **maize weevil also infests other types of stored, processed cereal products** such as pasta, **cassava**,<sup>[5]</sup> and various coarse, milled **grains**. **It has even been known to attack fruit** while in storage, such as **apples**.<sup>[7]</sup>

### Contents

- Description
- Distribution
- Life cycle
- Host range
- Damage and detection
- See also
- References
- Further reading
- External links

Classification

Family:	Curculionidae
Genus:	<i>Sitophilus</i>
Species:	<b><i>S. zeamais</i></b>

**Binomial name**

# Showcase - Ontology Enrichment (1)

The screenshot displays a web browser window with the URL [www.bugspray.com/article/maizeweevil.html](http://www.bugspray.com/article/maizeweevil.html). The article text is partially visible, showing a paragraph about rodenticide: "rodenticide is one of their favorite foods, be sure to check any bait placements you have done in the last couple of years. Attics are common areas where Maize Weevils thrive and then find their way inside living areas. If you have an attic with rodenticide, be sure to re-insure migration adults won't be able to..."

Below the browser window, a 'concept Editor' window is open, showing a 'concept Form' for the concept 'rodenticide'. The form includes the following fields:

- Name:
- Types:
- Broader Concepts:
- Preferred Labels:
- Properties:
  - skos:semanticRelation
  - 
  - skos:topConceptOf
  - skos:inScheme
  - 
  - rdfs:label:

A blue circle highlights the word 'rodenticide' in the article text, and a blue arrow points from this circle to the 'Preferred Labels' field in the concept editor. A blue speech bubble in the bottom left corner contains the text 'Adding Concepts'.

# Showcase - Ontology Enrichment (2)

Maize weevil - Wikipedia, the free encyclopedia - Mozilla Firefox

en.wikipedia.org/wiki/Maize\_weevil

maize weevil control, Maize Wee... | W Hemiptera - Wikipedia, the free ... | W Maize weevil - Wikipedia, the fre...

SKOS Panel (AgroIE)

Concepts Properties Schemes

Product  
Animal

Select triples to Add

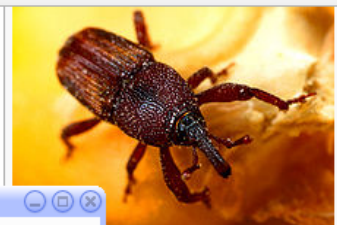
Select	Subject	Predicate	Object
<input type="checkbox"/>	coleoptera	http://aims.fao.org/aos/agrontology#isPestOf	oats
<input type="checkbox"/>	coleoptera	http://aims.fao.org/aos/agrontology#isPestOf	buckwheat
<input type="checkbox"/>	coleoptera	http://aims.fao.org/aos/agrontology#isPestOf	rye
<input type="checkbox"/>	coleoptera	http://aims.fao.org/aos/agrontology#isPestOf	barley
<input type="checkbox"/>	coleoptera	http://aims.fao.org/aos/agrontology#isPestOf	oats
<input type="checkbox"/>	coleoptera	http://aims.fao.org/aos/agrontology#isPestOf	sorghum
<input type="checkbox"/>	coleoptera	http://aims.fao.org/aos/agrontology#isPestOf	oryza
<input type="checkbox"/>	coleoptera	http://aims.fao.org/aos/agrontology#isPestOf	wheat
<input type="checkbox"/>	coleoptera	http://aims.fao.org/aos/agrontology#isPestOf	cereal
<input type="checkbox"/>	coleoptera	http://aims.fao.org/aos/agrontology#isPestOf	crop
<input type="checkbox"/>	oats	http://aims.fao.org/aos/agrontology#hasPest	coleoptera
<input type="checkbox"/>	buckwheat	http://aims.fao.org/aos/agrontology#hasPest	coleoptera
<input type="checkbox"/>	rye	http://aims.fao.org/aos/agrontology#hasPest	coleoptera
<input type="checkbox"/>	barley	http://aims.fao.org/aos/agrontology#hasPest	coleoptera
<input type="checkbox"/>	oats	http://aims.fao.org/aos/agrontology#hasPest	coleoptera
<input type="checkbox"/>	sorghum	http://aims.fao.org/aos/agrontology#hasPest	coleoptera
<input type="checkbox"/>	oryza	http://aims.fao.org/aos/agrontology#hasPest	coleoptera
<input type="checkbox"/>	wheat	http://aims.fao.org/aos/agrontology#hasPest	coleoptera
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<input type="checkbox"/>		http://aims.fao.org/aos/agrontology#hasPest	coleoptera

Cancel Add Triple(s)

Scripts currently forbidden | <SCRIPT>: 13 | <OBJECT>: 0

Options...

States, and is a major pest of maize.<sup>[3]</sup> This species attacks both standing crops and stored cereal products, including wheat, rice, sorghum,<sup>[4][5][6]</sup> oats, barley, rye, buckwheat,<sup>[6]</sup> peas, and cottonseed. The maize weevil also infests other types of stored, processed cereal products such as pasta, cassava,<sup>[5]</sup> and various coarse, milled grains. It has even been known to attack fruit while in storage, such as apples.<sup>[7]</sup>



- Scientific classification
- Animalia
  - Arthropoda
  - Insecta
  - Coleoptera
  - Curculionidae
  - Sitophilus
  - S. zeamals**
- Nominal name
- ophilus zeamals**  
Motschulsky, 1855

Adding Relations



# VocBench 2.0

VocBench is a **web-based, multilingual, editing and workflow tool that manages thesauri, authority lists and glossaries using SKOS-XL.**

Designed to meet the needs of semantic web and linked data environments, VocBench provides tools and functionalities that facilitate both ***collaborative editing and multilingual terminology***. It also includes administration and group management features that permit flexible roles for maintenance, validation and publication.

VocBench 2 is developed by a collaboration between the [Food and Agriculture Organization of the United Nations \(FAO\)](#) and the [ART Group](#) of the [University of Rome 'Tor Vergata'](#).

A growing [user community](#) has formed around VocBench, mainly made of [public organizations](#) which were looking for open source solutions for maintaining their thesauri, code lists and authority resources.

Born over the success of its first homonymous predecessor, which was developed for internal use in FAO, VocBench 2 represents a major shift in both design and outlook.

Based on a [service-oriented OSGi architecture](#), it is designed *to allow external developers to add functionality* via plug-ins without disturbing the core. This allows the current partnership to avoid the administrative burden of managing a full-blown open source community, while at the same time maintaining core functionalities and making the code public so that others can extend it.

Version 2 also features other important improvements such as native RDF support, support for different triple-stores, looser coupling between modules and more.

VocBench business and data access layers are handled by [Semantic Turkey](#), an open-source platform for Knowledge Acquisition and Management realized by the [ART Research Group](#) at the University of Rome - Tor Vergata.

# VocBench 2.0

Signed in as Administrator (Administrator) to: Eurovoc-Euvoc

Global data management | Administration | About VocBench | English | RSS feed | Preferences | Help | Sign out

VocBench VERSION 2.3 [Build 20150423] [DEVELOPMENT]

Exact word | Go | Advanced search

Recent changes | Concepts | Properties | Schemes | Validation | SPARQL | ICV

Concept navigation history | Content language

















Concepts  Show URI  Show non-preferred

- C** currency reform (en); currency situation (en); monetary policy (en); money policy (en); política monetaria (es); reforma monetaria (es); situación monetaria (es); política monetaria (it); riforma monetaria (it); situazione monetaria (it); stabilità monetaria (it)
- C** bank of issue (en); central bank (en); federal bank (en); national bank (en); banco central (es); Banco de España (es); banco emisor (es); banco federal (es); banco nacional (es); banca centrale (it); banca d'emissione (it); banca federale (it); banca nazionale (it); istituto d'emissione (it)
- C** currency adjustment (en); ajuste monetario (es); aggiustamento monetario (it); rettifica monetaria (it)
  - C** currency revaluation (en); revaluation (en); revalorización monetaria (es); revaluación (es); revaluación monetaria (es); rivalutazione (it); rivalutazione della moneta (it); rivalutazione monetaria (it)
  - C** devaluation (en); depreciación monetaria (es); devaluación (es); deprezzamento della moneta (it); svalutazione (it); svalutazione monetaria (it)
- C** issuing of currency (en); emisión de moneda (es); emisión monetaria (es); emissione di moneta (it); emissione monetaria (it)
- C** liquidity control (en); open-market operations (en); open-market policy (en); control de liquidez (es); mercado abierto (es); open market (es); operación de mercado abierto (es); política de mercado abierto (es); controllo della liquidità (it); operazione di mercato libero (it); politica di mercato libero (it)
- C** Economic and Monetary Union (en); EMU (en); Werner plan (en); Werner report (en); Informe Werner (es); Plan Werner (es); UEM (es); Unión Económica y Monetaria (es); piano Werner (it); rapporto Werner (it); UEM (it); Unione economica e monetaria (it)
- C** coordination of EMU policies (en); coordinación de políticas UEM (es); coordinamento delle politiche UEM (it)
  - C** multilateral surveillance (en); vigilancia multilateral (es); sorveglianza multilaterale (it)
  - C** Stability and Growth Pact (en); stability pact (en); pacto de estabilidad (es); Pacto de Estabilidad y Crecimiento (es); patto di stabilità (it); patto di stabilità e crescita (it)
- C** Economic and Financial Committee (en)
- C** ESCB (en); European System of Central Banks (en); SEBC (es); Sistema Europeo de Bancos Centrales (es); SEBC (it); Sistema europeo di banche centrali (it)
- C** single exchange-rate policy (en); política de cambios única (es); politica unica dei cambi (it)
- C** single monetary policy (en); política monetaria única (es); politica monetaria unica (it)
- C** timetable for EMU (en); calendario de la UEM (es); calendario dell'UEM (it)


coordination of EMU policies (en); coordinación de políticas UEM (es); coordinamento delle politiche UEM (it)  Show inferred and explicit  Show/hide tabs

Terms (27) | Definition (0) | Attribute (0) | Relationships (5) | Alignment (0) | Note (0) | Annotation (0) | Image (0) | Schemes (2) | Hierarchy | History (0)

+ Add new term

Language	Term
English (en)	<input checked="" type="checkbox"/> <input type="checkbox"/> coordination of EMU policies (Preferred) 
Español (es)	<input checked="" type="checkbox"/> <input type="checkbox"/> coordinación de políticas UEM (Preferred) 
Français (fr)	<input checked="" type="checkbox"/> <input type="checkbox"/> coordination des politiques UEM (Preferred) 
Português (pt)	<input checked="" type="checkbox"/> <input type="checkbox"/> coordenação das políticas UEM (Preferred) 
Cesky (cs)	<input checked="" type="checkbox"/> <input type="checkbox"/> koordinace politik v Evropské měnové unii (Preferred) 
Deutsch (de)	<input checked="" type="checkbox"/> <input type="checkbox"/> Koordinierung der WWU-Politiken (Preferred) 
Hungarian (hu)	<input checked="" type="checkbox"/> <input type="checkbox"/> GMU-politikák összehangolása (Preferred) 
Italiano (it)	<input checked="" type="checkbox"/> <input type="checkbox"/> coordinamento delle politiche UEM (Preferred) 
Polski (pl)	<input checked="" type="checkbox"/> <input type="checkbox"/> koordynacja polityk UGW (Preferred) 
Slovak (sk)	<input checked="" type="checkbox"/> <input type="checkbox"/> koordinácia politik EMÚ (Preferred) 
Swedish (sv)	<input checked="" type="checkbox"/> <input type="checkbox"/> samordning av EMU-politik (Preferred) 
suomi, suomen kieli (fi)	<input checked="" type="checkbox"/> <input type="checkbox"/> EMU-politikkojen yhteensovittaminen (Preferred) 
српски језик (sr)	<input checked="" type="checkbox"/> <input type="checkbox"/> координација политика ЕМУ (Preferred) 
Nederlands (nl)	<input checked="" type="checkbox"/> <input type="checkbox"/> coördinatie van EMU-beleid (Preferred) 
македонски јазик (mk)	<input checked="" type="checkbox"/> <input type="checkbox"/> координација на политиките на Економската и монетарната унија (Preferred)  <input checked="" type="checkbox"/> <input type="checkbox"/> координација на политиките за ЕМУ 

Legend  Proposed  Validated  Published  Revised  Proposed deprecated  Deprecated

Show more 

# VocBench 2.0: multilinguismo

- Concepts** Show URI Show non-preferred
- currency reform (en); currency situation (en); monetary policy (en); money policy (en); política monetaria (es); reforma monetaria (es); situación monetaria (es); política monetaria (it); riforma monetaria (it); situazione monetaria (it); stabilità monetaria (it)
  - bank of issue (en); central bank (en); federal bank (en); national bank (en); banco central (es); Banco de España (es); banco emisor (es); banco federal (es); banco nacional (es); banca centrale (it); banca d'emissione (it); banca federale (it); banca nazionale (it); istituto d'emissione (it)
  - currency adjustment (en); ajuste monetario (es); aggiustamento monetario (it); rettifica monetaria (it)
    - currency revaluation (en); revaluation (en); revalorización monetaria (es); revaluación (es); revaluación monetaria (es); rivalutazione (it); rivalutazione della moneta (it); rivalutazione monetaria (it)
    - devaluation (en); depreciación monetaria (es); devaluación (es); deprezzamento della moneta (it); svalutazione (it); svalutazione monetaria (it)
  - issuing of currency (en); emisión de moneda (es); emissione monetaria (es); emissione di moneta (it); emissione monetaria (it)
  - liquidity control (en); open-market operations (en); open-market policy (en); control de liquidez (es); mercado abierto (es); open market (es); operación de mercado abierto (es); política de mercado abierto (es); controllo della liquidità (it); operazione di mercato libero (it); politica di mercato libero (it)
  - Economic and Monetary Union (en); EMU (en); Werner plan (en); Werner report (en); Informe Werner (es); Plan Werner (es); UEM (es); Unión Económica y Monetaria (es); piano Werner (it); rapporto Werner (it); UEM (it); Unione economica e monetaria (it)
  - coordination of EMU policies (en); coordinación de políticas UEM (es); coordinamento delle politiche UEM (it)**
    - multilateral surveillance (en); vigilancia multilateral (es); sorveglianza multilaterale (it)
    - Stability and Growth Pact (en); stability pact (en); pacto de estabilidad (es); Pacto de Estabilidad y Crecimiento (es); patto di stabilità (it); patto di stabilità e crescita (it)
  - Economic and Financial Committee (en)
  - ESCB (en); European System of Central Banks (en); SEBC (es); Sistema Europeo de Bancos Centrales (es); SEBC (it); Sistema europeo di banche centrali (it)
  - single exchange-rate policy (en); política de cambios única (es); politica unica dei cambi (it)
  - single monetary policy (en); política monetaria única (es); politica monetaria unica (it)
  - timetable for EMU (en); calendario de la UEM (es); calendario dell'UEM (it)

coordination of EMU policies (en); coordinación de políticas UEM (es); coordinamento delle politiche UEM (it) Show inferred and explicit Show/hide tabs

Terms (27) | Definition (0) | Attribute (0) | Relationships (5) | Alignment (0) | Note (0) | Annotation (0) | Image (0) | Schemes (2) | Hierarchy | History (0)

Add new term

Language	Term
English (en)	coordination of EMU policies (Preferred) W

**Select languages to display**

Use this area to select languages you wish to see when viewing concepts, categories and relationships and to use in searching in your current session.

By default in every next login, the content language will be set to the users languages. All the changes in the content language will be valid for the current session only.

You will **always** see only in user languages when viewing terms associated with concepts and categories. To see in all the language, use the preferences area to check "Show only terms in selected languages" under "Administration" at top of the page.

Add new language

Order	Language (local)	Language (english)	Code
1	<input checked="" type="checkbox"/> english	english	en
4	<input checked="" type="checkbox"/> español	spanish	es
15	<input type="checkbox"/> persian	also known as farsi.	fa
32	<input type="checkbox"/> suomi, suomen kieli	finnish	fi
41	<input type="checkbox"/> vosa vakaviti	fijian	fj
6	<input type="checkbox"/> français	french	fr
18	<input type="checkbox"/> हिन्दी	hindi	hi
44	<input type="checkbox"/> hrvatski	croatian	hr
20	<input type="checkbox"/> hungarian	hungarian	hu
31	<input type="checkbox"/> bahasa indonesia	indonesian	id
21	<input checked="" type="checkbox"/> italiano	italian	it
16	<input type="checkbox"/> 日本語	japanese	ja
27	<input type="checkbox"/> 한국어	korean	ko

Select all | Clear all | Save | Cancel

Preferred) W

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multilingual editing

...and visualization

# VocBench Facts (1)

## **Utilizzato da Enti di rilevanza nazionale e internazionale** (tra cui)

- Food and Agriculture Organization ([FAO](#)) > [AGROVOC](#), [Biotechnology](#), [Land and Water](#), [FAO Topics](#)
- EU Publications Office > [EUROVOC](#)
- [Italian Senate](#) > [TESEO](#)
- United Nations Environment Programme ([UNEP](#)) > [InforMEA](#), in the context of [MEA](#), the Information and Knowledge Management Initiative
- European Environment Agency ([EEA](#)) > [GEMET](#)
- [Harvard University](#) > Unified Astronomy Thesaurus ([UAT](#))
- EC Parliament Library
- Institut National de la Recherche Agronomique ([INRA](#)) > in the context of [AnaEE France project](#) (ecosystems and biodiversity thesaurus) and Délégation à l'information scientifique et technique (DIST)
- [CABI](#)
- United Nations Convention to Combat Desertification ([UNCCD](#))
- [Scottish Government](#) > Gov metadata
- Columbia University > [IEDA Thesaurus](#)



# VocBench Facts (2)

## Pubblicazioni di riferimento

- *Armando Stellato, Sachit Rajbhandari, Andrea Turbati, Manuel Fiorelli, Caterina Caracciolo, Tiziano Lorenzetti, Johannes Keizer and MariaTeresa Pazienza* **VocBench: A Web Application for Collaborative Development of Multilingual Thesauri, The Semantic Web. Latest Advances and New Domains**, doi:10.1007/978-3-319-18818-8\_3, (Gandon, Fabien and Sabou, Marta and Sack, Harald and d'Amato, Claudia and Cudré-Mauroux, Philippe and Zimmermann, Antoine eds.), **Lecture Notes in Computer Science, 9088, 38-53**, Springer International Publishing, 2015
- *Maria Teresa Pazienza, Noemi Scarpato, Armando Stellato and Andrea Turbati* **Semantic Turkey: A Browser-Integrated Environment for Knowledge Acquisition and Management**, **Semantic Web Journal, 3, 2**, 2012
- *Manuel Fiorelli, Maria Teresa Pazienza and Armando Stellato* **Semantic Turkey goes SKOS: Managing Knowledge Organization Systems**, **ISemantics 2012** Graz, Austria, 5-7 September, 2012

## Futuro: VocBench 3.0

- completamente basato sul sistema Semantic Turkey
- consentirà di sviluppare collaborativamente sia tesauri che ontologie
- supporto avanzato per ontology evolution & validation
- supportato da programma ISA: Interoperability Solutions for European Public Administration (<http://ec.europa.eu/isa/>)

# Contributi Principali Tor Vergata al Multilinguismo



- **OntoLing** (2006) [1]
- **Linguistic Watermark** [2]: una suite di librerie e ontologie per l'uso di risorse lessicali e per il loro interfacciamento con risorse ontologiche
- il già citato [3]: **VocBench** (2009 on)
- **OntoLex**: partecipazione al Community Group W3C Ontology-Lexica (OntoLex) e contributi (portati da esperienza Linguistic Watermark) al modulo principale per l'interfacciamento ontologie e lessici
- **Lime (Linguistic Metadata)** [4]: modulo per i metadati di OntoLex sviluppato principalmente da noi e con contributi di altri membri della comunità scientifica

[1] Maria Teresa Pazienza, Armando Stellato and Andrea Turbati **A Suite of Semantic Web Tools Supporting Development of Multilingual Ontologies**, doi:10.1007/978-3-642-14000-6, (G. Armano and Marco de Gemmis and Giovanni Semeraro and Eloisa Vargiueds.), **Studies in Computational Intelligence Series, Intelligent Information Access, SCI 301, 109-136**, Springer-Verlag, July, 2010

[2] Maria Teresa Pazienza, Armando Stellato, Andrea Turbati **Linguistic Watermark 3.0: an RDF framework and a software library for bridging language and ontologies in the Semantic Web** *Semantic Web Applications and Perspectives, 5th Italian Semantic Web Workshop (SWAP2008)* FAO-UN, Rome, Italy, 15-17 December, 2008

[3] Armando Stellato, Sachit Rajbhandari, Andrea Turbati, Manuel Fiorelli, Caterina Caracciolo, Tiziano Lorenzetti, Johannes Keizer and MariaTeresa Pazienza **VocBench: A Web Application for Collaborative Development of Multilingual Thesauri**, *The Semantic Web. Latest Advances and New Domains*, doi:10.1007/978-3-319-18818-8\_3, (Gandon, Fabien and Sabou, Marta and Sack, Harald and d'Amato, Claudia and Cudré-Mauroux, Philippe and Zimmermann, Antoine eds.), **Lecture Notes in Computer Science, 9088, 38-53**, Springer International Publishing, 2015

[4] Manuel Fiorelli, Armando Stellato, JohnP. McCrae, Philipp Cimiano and MariaTeresa Pazienza **LIME: The Metadata Module for OntoLex**, *The Semantic Web. Latest Advances and New Domains*, doi:10.1007/978-3-319-18818-8\_20, (Gandon, Fabien and Sabou, Marta and Sack, Harald and d'Amato, Claudia and Cudré-Mauroux, Philippe and Zimmermann, Antoine eds.), **Lecture Notes in Computer Science, 9088, 321-336**, Springer International Publishing, 2015