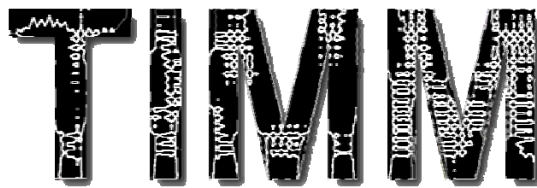


III Jornadas PLN-TIMM

5 y 6 de febrero de 2009

Campus de Colmenarejo, Universidad Carlos III de Madrid



CATÁLOGO DE RECURSOS LINGÜÍSTICOS, SISTEMAS Y  
SOFTWARE DE PROPÓSITO GENERAL  
EN INGENIERÍA LINGÜÍSTICA



# Índice

Presentación .....	6
1. Córpora, Bases de Datos y otros Recursos Lingüísticos.....	8
DeliciousT140 .....	8
ANCORA-CA .....	9
ANCORA-CO-ES .....	10
ANCORA-CO-CA .....	11
ANCORA-DEP-ES .....	11
ANCORA-DEP-CA .....	12
ANCORA-Verb-ES .....	13
ANCORA-Verb-CA .....	14
CESCA .....	15
EuroWordNet .....	15
MCR: Multilingual Central Repository .....	16
Arabic WordNet .....	17
DrugNer.....	19
LibiXaml .....	20
EDBL lexical database .....	21
EuskalWordnet .....	22
EPEC-DEP .....	22
EPEC-Eusemcor.....	23
Computer Science Tri-lingual Corpus.....	24
Lexicon of Prototypical Discourse Markers.....	25
SENSEM Verbal DB .....	26
SENSEM Corpus .....	28
Volem .....	29
Spanish WordNet 3.0.....	30
Geo-WordNet .....	31
GeoSemCor2.0.....	32
EmotiCorpus .....	32
ANERcorp.....	33
ANERgazet .....	34
Arabic QA .....	34

Single-label hep-ex Clustering Corpus.....	37
The KnCr clustering corpus .....	38
The Arabic Wikipedia XML corpus .....	39
Blogs Clustering Corpus .....	39
2. Analizadores, Etiquetadores, Clasificadores .....	41
FreeLing .....	41
LangIdent .....	42
SVMTool.....	43
SwiRL .....	44
BIOS.....	44
Jointparser .....	45
MOSTAS .....	45
Eustagger.....	47
Eihera .....	48
IXAti .....	48
Mendekotasunak .....	49
WSD-IXA .....	50
Dependency Grammar for Catalan.....	50
Dependency Grammar for English.....	51
Dependency Grammar for Spanish .....	51
SRG: Spanish Resource Grammar .....	52
CIAOSENSE .....	53
SVM Model for Arabic NER .....	54
WaCOS: Watermarking Corpora Online System .....	54
SemRol.....	55
SUPAR .....	56
WSD-UA.....	57
HMM PoS ACOPOST .....	57
NERUA .....	58
3. Sistemas para tareas específicas.....	60
3.1 Asistentes y Sistemas de Diálogo.....	60
Asistente Virtual Semántico .....	60
Flexible Dialogue System .....	61

INTERACTOR (Natural Interaction Platform).....	63
3.2 Buscadores .....	65
FlickrBabel.....	65
Arabic JIRS .....	66
JBrainDead.....	66
FlickLing.....	67
IR-n .....	68
3.3 Sistemas de Búsqueda de Respuestas.....	69
SQUASH.....	69
Ihardetsi.....	70
3.4 Sistemas de Traducción Automática .....	71
Matxin .....	71
3.5 Sistemas de Resumen Automático .....	72
LCsum.....	72
AutoPan.....	73
4. Librerías y software de propósito general (en ingeniería lingüística).....	74
TRIELIB .....	74
JDBIR library .....	75
IQmt .....	75
MiLL .....	76
OMLET & FRIES .....	77
LabelTranslator .....	77
OMV: Ontology Metadata Vocabulary.....	78
Oyster: Distributed Ontology Registry.....	79
InTime Platform .....	80
JPM Framework.....	81
ARIES: A Lexical Base and Platform .....	81
QARLA.....	82
5. Otros servicios y <i>know-how</i> .....	84
Morphosyntactic Annotation in Spanish Service (PoS and lemmatization).....	84
Systemized Process of Corpora Development .....	85

## Presentación

La red temática TIMM (Tratamiento de Información Multilingüe y Multimodal) dentro del programa de acciones complementarias (TSI2007-30967-E) <http://sinai.ujaen.es/timm>, y el consorcio MAVIR (<http://www.mavir.net>) han facilitado la elaboración de una primera versión del catálogo de recursos, sistemas y software de propósito general en ingeniería lingüística.

Este catálogo se presentará en el marco de las III jornadas sobre “Modelos y técnicas para el acceso a la información multilingüe y multimodal en la web”, en el Campus de Colmenarejo del Departamento de Informática de la Universidad Carlos III de Madrid.

El objetivo de las jornadas es promover la difusión de las actividades de investigación, desarrollo e innovación entre los diferentes grupos de investigación de ámbito nacional. Se persiguen dos objetivos específicos:

- crear un foro donde los investigadores en formación puedan presentar y discutir su trabajo en un ambiente que facilite el intercambio de ideas y la colaboración.
- realizar un catálogo de recursos lingüísticos y herramientas desarrolladas en los diferentes grupos de investigación para fomentar su uso y difusión entre otros grupos.

En esta memoria se incluyen las fichas del catálogo.

Agradecemos al Departamento de Informática de la UC3M y en concreto al grupo de investigación LABDA, dirigido por la Profesora Dña. Paloma Martínez, por su soporte y apoyo a las jornadas. Finalmente agradecer la cofinanciación del consorcio MAVIR y a la red TIMM, en cuyo marco se organiza por tercera vez estas jornadas.

**Edición del catálogo:** Víctor Peinado y Ana García Serrano, UNED {victor, agarcia}@lsi.uned.es



# 1. Córpora, Bases de Datos y otros Recursos Lingüísticos

## DeliciousT140

**Authors:** Arkaitz Zubiaga, Alberto P. García-Plaza, Víctor Fresno, Raquel Martínez (UNED)

**References:** <http://nlp.uned.es/~azubiaga/delicioust140>

**Description:** DeliciousT140: Colección de 144.574 documentos web en inglés, con su correspondiente información de tags extraída de Delicious en junio de 2008, a partir de los feeds ofrecidos por este sitio web para los 140 tags más populares.

**Functionality:** Análisis y minería de etiquetas sociales, Recuperación de Información, Clasificación Automática.

**Technology:** Se ofrecen los documentos web en su formato original (html, pdf,...), junto con un documento xml que contiene la información de tags.

**Technical Requirements:** 2 GB de espacio en disco

**Modules:** -

**Innovation:** Primera colección disponible de información de etiquetas sociales que incluye también el contenido de los documentos web.

**Development:** Desarrollo de un artículo de investigación, desarrollo de una tesis.

**Publications:** No disponible aún.

**Contact:** Arkaitz Zubiaga <[azubiaga@lsi.uned.es](mailto:azubiaga@lsi.uned.es)>

## ANCORA-ES

**Authors:** CLiC-UB (Centre de Llenguatge i Computació -Universitat de Barcelona: M.Antònia Martí, Mariona Taulé, Lluís Màrquez and Manuel Bertran.

**References:** <http://clic.ub.edu/ancora>

**Description:** AnCora-Es is a multilevel annotated corpus of Spanish, consisting of 500,000 words mostly from newspaper articles. AnCora-Es is annotated with morphological (PoS), syntactic (constituents and functions) and semantic (argument structure and thematic roles, semantic class, named entities and WordNet senses) information. All resulting layers are independent of each other, thus making easier the data management. The annotation was performed manually, semiautomatically, or fully automatically, depending on the encoded linguistic information.

**Functionality:** Annotated corpora constitute a crucial resource to acquire or infer linguistic knowledge about how languages are used. In this line, AnCora-Es is a very useful resource for computational and linguistic analysis of language, especially necessary for machine learning systems. This corpus is used as source of information for developing POS taggers, syntactic parsers and, Semantic Role Labelling, Word Sense Disambiguation, Named Entity Recognition and Classification systems. This corpus was used in the *SemEval 2007 task*: [Multilevel Semantic Annotation of Catalan and Spanish](#).

**Technology:** Data stored in XML format



**Technical Requirements:** -

**Modules:** -

**Innovation:** At present AnCora-Es is the largest Spanish corpus annotated at all the linguistic levels described above freely available.

**Development:** The development of AnCora-Es has been funded by the following projects: 3LB (FIT-150-500-2002-244), CESS-ECE (HUM2004-21127), PRAXEM (HUM2006-27378-E), and Lang2World (TIN2006-15265-C06-06) from the Spanish Ministry of Education and Science.

**Publications:**

Taulé, M., M.A. Martí, M. Recasens (2008) [Ancora: Multilevel Annotated Corpora for Catalan and Spanish](#). Proceedings of 6th International Conference on Language Resources and Evaluation. Marrakesh (Morocco).

**Contact:** M. Antònia Martí <[amarti@ub.edu](mailto:amarti@ub.edu)>

## ANCORA-CA

**Authors:** CLiC-UB (Centre de Llenguatge i Computació -Universitat de Barcelona: M.Antònia Martí, Mariona Taulé, Lluís Màrquez and Manuel Bertran.

**References:** <http://clic.ub.edu/ancora>

**Description:** AnCora-Ca is a multilevel annotated corpus of Catalan, consisting of 500,000 words mostly from newspaper articles. AnCora-Ca is annotated with morphological (PoS), syntactic (constituents and functions) and semantic (argument structure and thematic roles, semantic class, named entities and WordNet senses) information. All resulting layers are independent of each other, thus making easier the data management. The annotation was performed manually, semiautomatically, or fully automatically, depending on the encoded linguistic information.

**Functionality:** Annotated corpora constitute a crucial resource to acquire or infer linguistic knowledge about how languages are used. In this line, AnCora-Ca is a very useful resource for computational and linguistic analysis of language, especially necessary for machine learning systems. This corpus is used as source of information for developing POS taggers, syntactic parsers and, Semantic Role Labelling, Word Sense Disambiguation, Named Entity Recognition and Classification systems. This corpus was used in the *SemEval 2007 task*: [Multilevel Semantic Annotation of Catalan and Spanish](#)

**Technology:** Data stored in XML format

**Technical Requirements:** -

**Modules:** -

**Innovation:** At present AnCora-Ca is the largest Catalan corpus annotated at all the linguistic levels described above freely available

**Development:** The development of AnCora-Ca has been funded by the following projects: 3LB (FIT-150-500-2002-244), CESS-ECE (HUM2004-21127), PRAXEM (HUM2006-27378-E), and Lang2World (TIN2006-15265-C06-06) from the Spanish Ministry of Education and Science, and the funding given by the Catalan Secretary of Linguistic Policy.

**Publications:**

Taulé, M., M.A. Martí, M. Recasens (2008) [Ancora: Multilevel Annotated Corpora for Catalan and Spanish](#). Proceedings of 6th International Conference on Language Resources and Evaluation. Marrakesh (Morocco).

**Contact:** M. Antònia Martí <[amarti@ub.edu](mailto:amarti@ub.edu)>

## ANCORA-CO-ES

**Authors:** CLiC-UB (Centre de Llenguatge i Computació -Universitat de Barcelona: M.Antònia Martí, Mariona Taulé, Marta Recasens, Lluís Màrquez and Manuel Bertran

**References:** <http://clic.ub.edu/ancora>

**Description:** AnCora-CO-Es is a subset of the multilevel annotated corpus AnCora-Es (for Spanish), consisting of 400,000 words, enriched with coreference information, where all noun phrases (NPs) – pronominal or with a nominal head– pointing to the same entity are linked.

**Functionality:** AnCora-CO-Es can be a useful resource for training and evaluating coreference resolution systems for Spanish. From a linguistic point of view, the annotated corpus can be used as a workbench to test and validated hypotheses on coreferential expressions for Spanish. This corpus will be used in SemEval 2010 coreference resolution task: <http://stel.ub.edu/semEval2010-coref>

**Technology:** Data stored in XML format

**Technical Requirements:** -

**Modules:** -

**Innovation:** At present AnCora-CO-Es is the largest Spanish corpus annotated with coreference and freely available.

**Development:** The development of AnCora-CO-Es has been funded by the following projects: PRAXEM (HUM2006-27378-E) and Lang2World (TIN2006-15265-C06-06) from the Spanish Ministry of Education and Science.

**Publications:**

Recasens, M., M.A.Martí, M. Taulé (2008) First-mention Definites: More than Exceptional Cases, S. Featherson & S. Winkler (eds), *Fruits: Process and Product in Empirical Linguistics*. Berlin: de Gruyter.

Recasens, M. (2008) *Towards Coreference Resolution for Catalan and Spanish*. Master Thesis. Universitat de Barcelona.

Recasens, M., M. A. Martí i M. Taulé (2007) *'Where Anaphora and Coreference Meet. Annotation in the CESS-ECE Corpus'*. *Recent Advances in Natural language Processing*. Borovets, Bulgaria

**Contact:** Mariona Taulé <[mtaule@ub.edu](mailto:mtaule@ub.edu)>

## ANCORA-CO-CA

**Authors:** CLiC-UB (Centre de Llenguatge i Computació -Universitat de Barcelona: M.Antònia Martí, Mariona Taulé, Marta Recasens, Lluís Màrquez and Manuel Bertran

**References:** <http://clic.ub.edu/ancora>

**Description:** AnCora-CO-Ca is a subset of the multilevel annotated corpus AnCora-Ca (for Catalan), consisting of 400,000 words, enriched with coreference information, where all noun phrases (NPs) – pronominal or with a nominal head– pointing to the same entity are linked.

**Functionality:** AnCora-CO-Ca can be a useful resource for training and evaluating coreference resolution systems for Catalan. From a linguistic point of view, the annotated corpus can be used as a workbench to test and validated hypotheses on coreferential expressions for Catalan. This corpus will be used in SemEval 2010 coreference resolution task: <http://stel.ub.edu/semEval2010-coref>

**Technology:** Data stored in XML format

**Technical Requirements:** -

**Modules:** -

**Innovation:** At present AnCora-CO-Ca is the largest Catalan corpus annotated with coreference and freely available.

**Development:** The development of AnCora-CO-Ca has been funded by the following projects: PRAXEM (HUM2006-27378-E) and Lang2World (TIN2006-15265-C06-06) from the Spanish Ministry of Education and Science, and the funding given by the Catalan Secretary of Linguistic Policy.

**Publications:**

Recasens, M., M.A.Martí, M. Taulé (2008) First-mention Definites: More than Exceptional Cases, S. Featherson & S. Winkler (eds), Fruits: Process and Product in Empirical Linguistics. Berlin: de Gruyter.

Recasens, M. (2008) Towards Coreference Resolution for Catalan and Spanish. Master Thesis. Universitat de Barcelona.

Recasens, M., M. A. Martí i M. Taulé (2007) 'Where Anaphora and Coreference Meet. Annotation in the CESS-ECE Corpus'. Recent Advances in Natural language Processing. Borovets, Bulgaria

**Contact:** Mariona Taulé <[mtaule@ub.edu](mailto:mtaule@ub.edu)>

## ANCORA-DEP-ES

**Authors:** CLiC-UB (Centre de Llenguatge i Computació -Universitat de Barcelona: M.Antònia Martí, Mariona Taulé, Lluís Màrquez and Manuel Bertran

**References:** <http://clic.ub.edu/ancora>

**Description:** AnCora-DEP-Es is the AnCora-Es multilevel annotated corpus of Spanish in dependency-based representation, consisting of 500,000 words approximately.

**Functionality:** AnCora-DEP-Es can be used as source of information for inducing grammars, developing,

improving and/or evaluating syntactic parsers and algorithms for semantic role labelling, dependency-based. This corpus is used in the *CoNLL Shared Task 2009: Syntactic and Semantic Dependencies in Multiple Languages*, where the core of the task is to predict syntactic and semantic dependencies and their labelling.

**Technology:** Data stored in XML format

**Technical Requirements:** -

**Modules:** -

**Innovation:** At present AnCora-DEP-Es is the largest corpus multilevel annotated available in dependency format freely downloaded.

**Development:** The development of AnCora-DEP-Es has been funded by the following projects: CESS-ECE (HUM2004-21127) and Lang2World (TIN2006-15265-C06-06).

**Publications:**

Civit, M., M.A. Martí & N. Bufí (2006) ‘Cat3LB and Cast3LB: from Constituents to dependencies’, Springer Verlag, *Advances in Natural Language Processing* (LNAI, 4139), pp. 141-153. Berlin, ISSN: 0302-9743.

**Contact:** M. Antònia Martí <[amarti@ub.edu](mailto:amarti@ub.edu)>

## ANCORA-DEP-CA

**Authors:** CLiC-UB (Centre de Llenguatge i Computació -Universitat de Barcelona: M.Antònia Martí, Mariona Taulé, Lluís Màrquez and Manuel Bertran

**References:** <http://clic.ub.edu/ancora>

**Description:** AnCora-DEP-Ca is the AnCora-Ca multilevel annotated corpus of Catalan in dependency-based representation, consisting of 500,000 words approximately.

**Functionality:** AnCora-DEP-Es can be used as source of information for for inducing grammars, developing, improving and/or evaluating syntactic parsers and algorithms for semantic role labelling, dependency-based. This corpus is used in the *CoNLL Shared Task 2009: Syntactic and Semantic Dependencies in Multiple Languages*, where the core of the task is to predict syntactic and semantic dependencies and their labelling.

**Technology:** Data stored in XML format

**Technical Requirements:** -

**Modules:** -

**Innovation:** At present AnCora-DEP-Ca is the largest corpus multilevel annotated available in dependency format freely downloaded.

**Development:** The development of AnCora-DEP-Ca has been funded by the following projects: CESS-ECE (HUM2004-21127) and Lang2World (TIN2006-15265-C06-06, and the funding given by the Catalan Secretary of Linguistic Policy.

**Publications:**

Civit, M., M.A. Martí & N. Bufí (2006) 'Cat3LB and Cast3LB: from Constituents to dependencies', Springer Verlag, *Advances in Natural Language Processing* (LNAI, 4139), pp. 141-153. Berlin, ISSN: 0302-9743.

**Contact:** M. Antònia Martí <[amarti@ub.edu](mailto:amarti@ub.edu)>

**ANCORA-Verb-ES**

**Authors:** CLiC-UB (Centre de Llenguatge i Computació -Universitat de Barcelona: M.Antònia Martí, Mariona Taulé, Marta Recasens, Aina Peris, Lluís Màrquez and Manuel Bertran

**References:** <http://clic.ub.edu/ancora>

**Description:** AnCora-Verb-Es is a verbal lexicon containing 2,603 different verbs. In AnCora-Verb-Es lexicon, the mapping between syntactic functions, arguments and thematic roles of each verbal predicate it is established taking into account the verbal semantic class and the diatheses alternations in which the predicate can participate. Each verbal predicate may be divided in different senses where each sense is related to one or more semantic classes (Lexical Semantic Structures), basically differentiated according to the four event classes -accomplishments, achievements, states and activities-, and on the diatheses alternations in which a sense can occur.

**Functionality:** AnCora-Verb-Es is the verbal lexicon used as the basis for the semantic annotation with arguments and thematic roles of AnCora-Es corpus. This lexical resource can be used for syntactic and semantic parsing, lexical representation, etc. This lexicon was used in the *SemEval 2007 task*: [Multilevel Semantic Annotation of Catalan and Spanish](#)

**Technology:** -

**Technical Requirements:** -

**Modules:** -

**Innovation:** At present AnCora-Verb-Es is the largest verbal lexicon containing information about verbal semantic classes, syntactic subcategorization, argument structure and the corresponding thematic roles, as well as diatheses alternations, freely available

**Development:** The development of AnCora-Verb-Ca has been funded by the following projects: PRAXEM (HUM2006-27378-E) and Lang2World (TIN2006-15265-C06-06) from the Spanish Ministry of Education and Science.

**Publications:**

Aparicio, J., M. Taulé, M.A. Martí (2008) AnCora-Verb: A Lexical Resource for the Semantic Annotation of Corpora. Proceedings of 6th International Conference on Language Resources and Evaluation. Marrakesh (Morocco).

Aparicio, J., M. Taulé, M.A. Martí (2008) AnCora-Verb: Two large-scale lexicons for Catalan and Spanish. Bernal, E. Decesaris, J. (eds.) Proceedings of the XIII Euralex International Congress 2008. Institut Universitari de Lingüística Aplicada, UPF: Barcelona (Spain).

**Contact:** Mariona Taulé <[mtaule@ub.edu](mailto:mtaule@ub.edu)>

## ANCORA-Verb-CA

**Authors:** CLiC-UB (Centre de Llenguatge i Computació -Universitat de Barcelona: M.Antònia Martí, Mariona Taulé, Marta Recasens, Aina Peris, Lluís Màrquez and Manuel Bertran

**References:** <http://clic.ub.edu/ancora>

**Description:** AnCora-Verb-Ca is a verbal lexicon containing 2,141 different verbs. In AnCora-Verb-Ca lexicon, the mapping between syntactic functions, arguments and thematic roles of each verbal predicate is established taking into account the verbal semantic class and the diatheses alternations in which the predicate can participate. Each verbal predicate may be divided in different senses where each sense is related to one or more semantic classes (Lexical Semantic Structures), basically differentiated according to the four event classes -accomplishments, achievements, states and activities-, and on the diatheses alternations in which a sense can occur.

**Functionality:** AnCora-Verb-Ca is the verbal lexicon used as the basis for the semantic annotation with arguments and thematic roles of AnCora-Ca corpus. This lexical resource can be used for syntactic and semantic parsing, lexical representation, etc. This lexicon was used in the *SemEval 2007 task*: [Multilevel Semantic Annotation of Catalan and Spanish](#)

**Technology:** -

**Technical Requirements:** -

**Modules:** -

**Innovation:** At present AnCora-Verb-Ca is the largest verbal lexicon containing information about verbal semantic classes, syntactic subcategorization, argument structure and the corresponding thematic roles, as well as diatheses alternations, freely available.

**Development:** The development of AnCora-Verb-Ca has been funded by the following projects: PRAXEM (HUM2006-27378-E), and Lang2World (TIN2006-15265-C06-06) from the Spanish Ministry of Education and Science, and the funding given by the Catalan Secretary of Linguistic Policy.

**Publications:**

Aparicio, J., M. Taulé, M.A. Martí (2008) AnCora-Verb: A Lexical Resource for the Semantic Annotation of Corpora. Proceedings of 6th International Conference on Language Resources and Evaluation. Marrakesh (Morocco).

Aparicio, J., M. Taulé, M.A. Martí (2008) AnCora-Verb: Two large-scale lexicons for Catalan and Spanish. Bernal, E. Decesaris, J. (eds.) Proceedings of the XIII Euralex International Congress 2008. Institut Universitari de Lingüística Aplicada, UPF: Barcelona (Spain).

**Contact:** Mariona Taulé <[mtaule@ub.edu](mailto:mtaule@ub.edu)>

## CESCA

**Authors:** CLiC-UB (Centre de Llenguatge i Computació -Universitat de Barcelona: Liliana Tolchinsky, M. Antònia Martí, Mariona Taulé

**References:** <http://cllc.ub.edu/cesca>

**Description:** CESCA is a Catalan corpus consisting of scholar writing text elaborated by 2,400 scholars between the ages of five and sixteen. Each informant has written different types of text: vocabularies, narrative and definition texts as well as jokes.

**Functionality:** This corpus allows studies about language development; literacy; relationship between oral text and spelling; linguistic analysis of spontaneous language, etc.

**Technology:** -

**Technical Requirements:** -

**Modules:** -

**Innovation:** It does not exist an another corpus of this size and characteristics for Catalan. It allows studies about evolution of language taking into account the same parameters among a huge amount of population.

**Development:** The development of CESCA has been funded by the following projects: 2006ARIE-10058, 2007ARIE-00005, 2008ARIE-00053 from the Generalitat de Catalunya (AGAUR).

**Publications:** -

**Contact:** M. Antònia Martí <[amarti@ub.edu](mailto:amarti@ub.edu)>

## EuroWordNet

**Authors:** TALP, CLIC and UNED.

**References:** <http://www.lsi.upc.edu/~nlp/projectes/ewn.html> , <http://www.ilc.uva.nl/EuroWordNet>

**Description:** EuroWordNet is a multilingual database with wordnets for several European languages (Dutch, Italian, Spanish, German, French, Czech and Estonian). The wordnets are structured in the same way as the American wordnet for English (Princeton WordNet, Miller et al. 1990) in terms of synsets (sets of synonymous words) with basic semantic relations between them. Each wordnet represents a unique language-internal system of lexicalizations. In addition, the wordnets are linked to an Inter-Lingual-Index, based on the Princeton wordnet. Via this index, the languages are interconnected so that it is possible to go from the words in one language to similar words in any other language. The index also gives access to a shared top ontology of 63 semantic distinctions. This top ontology provides a common semantic framework for all the languages, while language specific properties are maintained in the individual wordnets. The database can be used, among others, for monolingual and cross-lingual information retrieval, which was demonstrated by the users in the project.

**Functionality:** To add Semantic Knowledge to any Resource.

**Technology:** Java, Php, Perl are used for the Demos. MySQL is used by the Database containing MCR.

**Technical Requirements:** Java, Perl, Apache and MySQL are required for the use of MCR.

**Modules:** -

**Innovation:** This tool was created in the framework of the EuroWordNet project. The most important results were: 1) the wordnets for each separate language (Dutch, Italian, Spanish, French, German, Czech and Estonian) linked to the English WordNet;; 2) the addition to Wordnet1.5 of relations not covered in the Princeton Wordnet for English;; 3) WordNet1.5 in EuroWordNet format; 4) an Inter-Lingual-Index (based on WordNet1.5) to connect the different wordnets and other ontologies; 5) the shared top ontology; 6) Polaris: a wordnet editor to create and edit wordnets linked to EuroWordNet; 7) Periscope: the EuroWordNet viewer in which all this can be viewed and selections can be exported; 8) a report on the demonstration of the results in information retrieval tasks.

**Development:** It was developed in the framework of an European Project called EuroWordNet: Building a multilingual wordnet with semantic relations between words, which lasted 3 years, from 1996 to 1999.

**Publications:**

There are a lot of related publications, including Deliverables and Reports that can be found at <http://www.illc.uva.nl/EuroWordNet/docs.html>

**Contact:** Lluís Padró <[padro@lsi.upc.edu](mailto:padro@lsi.upc.edu)>

## **MCR: Multilingual Central Repository**

**Authors:** TALP, and the other members of the MEANING project.

**References:** <http://garraf.epsevg.upc.es/cgi-bin/wei4/public/wei.consult.perl> ,  
<http://www.lsi.upc.es/~nlp/meaning/demo/demo.html>

**Description:** The Multilingual Central Repository (MCR) follows the model proposed by the EuroWordNet project. EuroWordNet (Vossen, 1998) is a multilingual lexical database with wordnets for several European languages, which are structured as the Princeton WordNet. The Princeton WordNet contains information about nouns, verbs, adjectives and adverbs in English and is organized around the notion of a synset.

The current version of the MCR (Atserias et al., 2004) is a result of the 5th Framework MEANING project. The MCR integrates into the same EuroWordNet framework wordnets from five different languages (together with four English WordNet versions). The MCR also integrates WordNet Domains (Magnini and Cavaglià, 2000) and new versions of the Base Concepts and Top Concept Ontology. The final version of the MCR contains 1,642,389 semantic relations between synsets, most of them acquired by automatic means. This is almost one order of magnitude larger than the Princeton WordNet (204,074 unique semantic relations in WordNet 2.0).

**Functionality:** To add Semantic Knowledge to any Resource.



**Technology:** Java, Php, Perl are used for the Demos. MySQL is used by the Database containing MCR.

**Technical Requirements:** Java, Perl, Apache and MySQL are required for the use of MCR.

**Modules:** -

**Innovation:** Currently, MCR integrates into the EuroWordNet framework five local wordnets (including four versions of the English WordNet from Princeton), the EuroWordNet Top Concept ontology, MultiWordNet Domains, and hundreds of thousand of new semantic relations and properties automatically acquired from corpora. MCR constitutes the largest and richest multilingual resource for lexical knowledge ever build.

**Development:** MCR (Multilingual Central Repository) was the result of the 5th Framework European MEANING Project (2002-2005).

**Publications:** There are a lot of related publications, including Deliverables and Reports that can be found here: <http://www.lsi.upc.es/~nlp/meaning/documentation/3rdYear>

Cuadros M. and Rigau G. KnowNet: Building a Large Net of Knowledge from the Web. 22nd International Conference on Computational Linguistics COLING'08. Manchester, UK. 2008.

Álvez J., Atserias J., Carrera J., Climent S., Laparra E., Oliver A. and Rigau G. Complete and Consistent Annotation of WordNet using the Top Concept Ontology. 6th international conference on Language Resources and Evaluation, LREC'08, Marrakesh, Morocco. 2008.

Cuadros M. and Rigau G. Quality Assessment of Large-Scale Knowledge Resources. Proceedings of Joint SIGDAT Conference on Empirical Methods in Natural Language Processing (EMNLP'06). Sydney, Australia. 2006.

Atserias J., Villarejo L., Rigau G., Agirre E., Carroll J., Magnini B., Vossen P. The MEANING Multilingual Central Repository. In Proceedings of the Second International Global WordNet Conference (GWC-2004). ISBN 80-210-3302-9. Brno, Czech Republic. Enero, 2004.

**Contact:** German Rigau <[german.rigau@ehu.es](mailto:german.rigau@ehu.es)>

## Arabic WordNet

**Authors:** Musa Alkhalifa, Manuel Bertran, William J. Black, Sabri Elkateb, Javier Farreres, David Farwell, Christiane Fellbaum, James Kirk, Ma Antònia Martí, Adam Pease, Horacio Rodríguez, Piek Vossen

**References:** <http://www.globalwordnet.org/AWN>

**Description:** The Arabic WordNet (AWN) is a lexical database of the Arabic language following the development process of Princeton English WordNet and Euro WordNet. It utilizes the Suggested Upper Merged Ontology as an interlingua to link Arabic WordNet to previously developed wordnets. Christiane Fellbaum at Princeton was the project lead. The project was sponsored by DOI/REFLEX.

From <http://www.globalwordnet.org/AWN/DataSpec.html> you can get the XML data exchange specifications of the database. Roughly AWN contains 11,000 synsets (including 1,000 NE). Figures of the current coverage of AWN can be obtained from: [http://www.lsi.upc.edu/~mbertran/arabic/awn/query/sug\\_statistics.php](http://www.lsi.upc.edu/~mbertran/arabic/awn/query/sug_statistics.php)

There are several different ways for accessing the database: 1) The browser package (available at <http://sourceforge.net/projects/awnbrowser>) includes the AWN data and PWN2.0 mappings in a relational database. You can use the export facilities to export the data as XML or CSV and do what you will with it in textual form. 2) The browser source code contains methods written in Java which access the DB in order to retrieve the data structures the browser displays. The AWN code has been placed on Sourceforge at <http://awnbrowser.cvs.sourceforge.net/awnbrowser/source/awnbrowser>. There's 2-page document about the source code there too. 3) The database can also be downloaded in xml format (linked to pwn 2.0) from [http://www.lsi.upc.edu/~mbertran/arabic/bd/get\\_bd.php](http://www.lsi.upc.edu/~mbertran/arabic/bd/get_bd.php). If you are interested on data connected with other English WN versions you can get it from [http://www.lsi.upc.edu/~mbertran/arabic/bd/get\\_bd.php?ver={20,21,30,awn}](http://www.lsi.upc.edu/~mbertran/arabic/bd/get_bd.php?ver={20,21,30,awn}). 4) A set of basic python functions for accessing the database can be obtained from: <http://www.lsi.upc.edu/~horacio/varios/AWNDatabaseManagement.py.gz>

In addition to the AWN database and the AWN browser some other complementary software has been produced including: 1) The AWN Lexicographer's Web Interface (Barcelona) [http://www.lsi.upc.edu/~mbertran/arabic/awn/update/synset\\_browse.php](http://www.lsi.upc.edu/~mbertran/arabic/awn/update/synset_browse.php) . 2) The AWN User's Web Interface (Barcelona) <http://www.lsi.upc.edu/~mbertran/arabic/awn/index.html> . 3) The AWN word spotter can be accessed at: <http://www.lsi.upc.edu/~mbertran/arabic/wwwWn7/>

**Functionality:** AWN Browser: Browsing the database . AWN can be downloaded in XML format and access its content be directly accessed.

**Technology:** Java, Perl, MySQL

**Technical Requirements:** -

**Modules:** -

**Innovation:** One of the most important lexical resources for Arabic language.

**Development:** -

**Publications:**

Christiane Fellbaum, Musa Alkhalifa, William J. Black, Sabri Elkateb, Adam Pease, Horacio Rodríguez, Piek Vossen (2006). Introducing the Arabic WordNet project. Proceedings of the 3rd Global Wordnet Conference, Jeju Island, Korea, January, 2006.

Christiane Fellbaum, Musa Alkhalifa, William J. Black, Sabri Elkateb, Adam Pease, Horacio Rodríguez, Piek Vossen (2006). Building a WordNet for Arabic. Proceedings of the the 5th Conference on Language Resources and Evaluation LREC2006, May, 2006.

Horacio Rodríguez, David Farwell, Javi Farreres, Manuel Bertran, Musa Alkhalifa, M. Antonia Martí, William Black, Sabri Elkateb, James Kirk, Adam Pease, Piek Vossen, and Christiane Fellbaum. Arabic WordNet: Current State and Future Extensions in: Proceedings of the Fourth International GlobalWordNet

Conference - GWC 2008, Szeged, Hungary, January 22-25, 2008.

Horacio Rodríguez, David Farwell, Javi Farreres, Manuel Bertran, Musa Alkhalifa, M. Antonia Martí (2008). Arabic WordNet: Semi-automatic Extensions using Bayesian Inference. Proceedings of the the 6th Conference on Language Resources and Evaluation LREC2008. Marrakech (Morocco), May 2008.

**Contact:** Horacio Rodríguez <[horacio@lsi.upc.edu](mailto:horacio@lsi.upc.edu)>

## DrugNer

**Authors:** Isabel Segura-Bedmar, Paloma Martínez, María Segura-Bedmar

**References :** Advanced Databases Group (Labda) of Universidad Carlos III de Madrid is a research group with an extensive activity in several Natural Language Processing and Information Retrieval projects: <http://basesdatos.uc3m.es/index.php?id=202&L=0>

**Description:** DrugNer Corpus: a corpus annotated with generic drug names and other biomedical concepts by [ISABEL SEGURA-BEDMAR](#) is licensed under a [Creative Commons Reconocimiento-No comercial-Compartir bajo la misma licencia 3.0 Unported License](#). <http://basesdatos.uc3m.es/index.php?id=359>

**Functionality:** -

**Technology:** XML

**Technical Requirements:** -

**Modules:** -

**Innovation:** This is the first biomedical corpus annotated with drug and their pharmacological families. Building a manually annotated corpus is a time-consuming, labor-intensive and expensive task. Machine learning methods are not often applied in the biomedical domain because of the lack of training data. GENIA and IProLINK are some of the available biomedical corpora, with their main drawback being that they are limited to proteins and genes and do not contain other types of biomedical concepts. For this reason, we believe that our corpus, DrugNer, could encourage research on automatic extraction information of drug interactions, adverse drug events and other drug information, occurring in biomedical and pharmacological texts.

**Development:** The corpus was automatically annotated with our DrugNer system, and manually evaluated by a pharmacological expert. The corpus consists of 849 abstracts that were downloaded from PubMed with the help of a web crawler, using the keyword 'drug interaction'.

Our system combines information obtained by the Unified Medical Language System (UMLS) MetaMap Transfer (MMTx) program and nomenclature rules recommended by the World Health Organization (WHO) International Nonproprietary Names (INNs) Program to identify and classify pharmaceutical substances. Moreover, the system is able to detect possible candidates for drug names that have not been detected by MMTx program by applying these rules, achieving, in this way, a broader coverage.

**Publications:**

Isabel Segura-Bedmar, Paloma Martínez, Maria Segura-Bedmar. Drug name recognition and classification in biomedical texts A case study outlining approaches underpinning automated systems. Drug Discovery Today, Volume 13, Issues 17-18, September 2008, Pages 816-823

Isabel Segura-Bedmar, Paloma Martínez, Doaa Samy. A preliminary approach to recognize generic drug names by combining UMLS resources and USAN naming conventions. In Proceedings of BIONLP'08, Association for Computational Linguistics (ACL) . Columbus, Ohio, 2008.

Isabel Segura-Bedmar, Paloma Martínez, Doaa Samy. Detección de fármacos genéricos en textos biomédicos. Revista Española para el procesamiento del lenguaje natural (SEPLN), Marzo 2008. n° 40. pp 27-34

**Contact:** Isabel Segura-Bedmar <[isegura@inf.uc3m.es](mailto:isegura@inf.uc3m.es)>, Paloma Martínez <[pmf@inf.uc3m.es](mailto:pmf@inf.uc3m.es)>

**LibiXaml**

**Authors:** IXA group. Propiedad intelectual: SS-412-08

**References:** -

**Description:** It is a framework for creating, browsing and editing linguistic annotations generated by a set of different linguistic processing tools.

**Functionality:** The aim is to establish a flexible and extensible infrastructure which follows a coherent and general representation scheme. This proposal provides us with a well-formalized basis for the exchange of linguistic information. It uses TEI-P4 conformant feature structures as a representation schema for linguistic analyses.

**Technology:** XML, C++, Berkeley DBXML and DB

**Technical Requirements:** -

Modules: -

**Innovation:** -

**Development:** -

**Publications:**

Artola X., Díaz de Ilarraza A., Ezeiza N., Gojenola K., Sologastoa A., Soroa A. 2004. EULIA: a graphical web interface for creating, browsing and editing linguistically annotated corpora. LREC 2004. ISBN 2-9517408-1-6

Artola X., Díaz de Ilarraza A., Ezeiza N., Gojenola K., Labaka G., Sologaitoa A., Soroa A. 2005. A framework for representing and managing linguistic annotations based on typed feature structures. RANLP 2005. ISBN: 954-91743-3-6

**Contact:** Iñaki Alegria <[i.alegria@ehu.es](mailto:i.alegria@ehu.es)>

## **EDBL lexical database**

**Authors:** IXA group. Propiedad intelectual: GI-97/1596

**References:** <http://ixa2.si.ehu.es/demo/edbl.jsp>

**Description:** EDBL (Euskararen Datu-Base Lexikala) is a general-purpose lexical database used in Basque text-processing tasks. It is a large repository of lexical knowledge (currently around 80,000 entries) that acts as basis and support in a number of different NLP tasks, thus providing lexical information for several language tools: morphological analysis, spell checking and correction, lemmatization and tagging, syntactic analysis, and so on. It has been designed to be neutral in relation to the different linguistic formalisms, and flexible and open enough to accept new types of information. A browser-based user interface makes the job of consulting the database, correcting and updating entries, adding new ones, etc. easy to the lexicographer.

**Functionality:** Lexical database for Basque

**Technology:** Oracle. XML exportation.

**Technical Requirements:** -

**Modules:** -

**Innovation:** First Lexical database for Basque

**Development:** Different projects funded by the Basque government.

**Publications:**

Aduriz I., Aldezabal I., Ansa O., Artola X., Díaz de Ilarraza A. EDBL: a Multi-Purposed Lexical Support for the Treatment of Basque. Proceedings of the First International Conference on Language Resources and Evaluation. Vol II. pp 821-826. Granada. May 28-30, 1998.

Aldezabal I., Ansa O., Arrieta B., Artola X., Ezeiza A., Hernández G., Lersundi M. EDBL: a General Lexical Basis for the Automatic Processing of Basque. IRCS Workshop on linguistic databases. Philadelphia (USA). 2001.

**Contact:** Iñaki Alegria <[i.alegria@ehu.es](mailto:i.alegria@ehu.es)>

## EuskalWordnet

**Authors:** IXA group. Propiedad intelectual: SS-323-03

**References:** <http://ixa2.si.ehu.es/mcr/wei.html>

**Description:** The Basque WordNet follows the EuroWordNet framework and, basically, it is produced using a semi-automatic method that links Basque words to the English WordNet. We have found that in order to ensure proper linguistic quality and avoid excessive English bias, a double manual pass on the automatically produced Basque synsets is desirable: a first concept-to-concept pass to ensure correctness of the Basque words linked to the synsets, and a word-to-word pass to ensure the completeness of the word senses linked to the words. By this method, we expect to combine quick progress (as allowed by a development based on the English WordNet) with quality (as provided by a development based on a native dictionary). We have completed the concept-to-concept review of the automatically produced links for the nominal concepts, and are currently performing the word-to-word review.

**Functionality:** Semantic database for Basque

**Technology:** MySQL

**Technical Requirements:** -

**Modules:** -

**Innovation:** First Semantic database for Basque

**Development:** Different projects funded by the Basque government.

**Publications:**

Agirre E., Ansa O., Arregi X., Arriola J., Díaz de Ilarraza A., Pociello E., Uria L. Methodological issues in the building of the Basque WordNet: quantitative and qualitative analysis. Proceedings of First International WordNet Conference. pp. 32-40. Mysore (India). 2002.

**Contact:** Iñaki Alegria <[i.alegria@ehu.es](mailto:i.alegria@ehu.es)>

## EPEC-DEP

**Authors:** IXA group

**References:** <http://ixa.si.ehu.es/Ixa/resources/Treebank>

**Description:** EPEC is a corpus of standard written Basque that has been manually tagged at different levels (morphology, surface syntax, phrases) and is currently being hand tagged at deep syntax level following the Dependency Structure-based Scheme. It is aimed to be a "reference" corpus for the development and

improvement of several NLP tools for Basque. This corpus has already been used for the construction of some tools such as a morphological analyser, a lemmatiser, or a shallow syntactic analyser.

The EPEC-DEP corpus is the EPEC (Reference Corpus for the Processing of Basque) corpus manually tagged with dependency relations. Part of this work was developed in the CESS-ECE project (HUM2004-21127). Since in this project the constituents based syntactic formalism was chosen for consulting the corpus of all languages, the conversion from the dependencies to the constituents had to be done. In this way, it is possible to get the EPEC corpus tagged either with dependency relations or with constituent relations.

**Functionality:** -

**Technology:** -

**Technical Requirements:** -

**Modules:** -

**Innovation:** First Basque corpus manually tagged at different levels (morphology, surface syntax, phrases).

**Development:**

**Publications:**

Aduriz I., Aranzabe M., Arriola J., Atutxa A., Díaz de Ilarraza A., Ezeiza N., Gojenola K., Oronoz M., Soroa A., Urizar R. 2003. Methodology and steps towards the construction of EPEC, a corpus of written Basque tagged at morphological and syntactic levels for the automatic processing. Proceedings of the Corpus Linguistics 2003. Lancaster

Aldezabal I., Aranzabe M.J., Arriola J.M., Díaz de Ilarraza A., Estarrona A., Fernandez K., Uria L., Quintian M.. 2007. EPEC (Euskararen Prozesamendurako Erreferentzia Corpora) dependentzietekin etiketatzeko eskuliburua. UPV/EHU / LSI / TR 12-2007

**Contact:** Iñaki Alegria <[i.alegria@ehu.es](mailto:i.alegria@ehu.es)>

## **EPEC-Eusemcor**

**Authors:** IXA group. Propiedad intelectual: SS-411-08

**References:** <http://sisx04.si.ehu.es:8080/eusemcor>

**Description:** Eusemcor is a hand annotated corpora for Basque (the Basque Semcor). This joint development allows for better motivated sense distinctions, and a tighter coupling between both resources. The methodology involves edition, tagging and refereeing tasks. We are currently half way through the nominal part of the 300.000 word corpus (roughly equivalent to a 500.000 word corpus for English).

**Functionality:** -

**Technology:** -

**Technical Requirements:** -

**Modules:** -

**Innovation:** First Basque corpus manually tagged at semantic level

**Development:** -

**Publications:**

Agirre E., Aldezabal I., Etxeberria J., Izagirre E., Mendizabal K., Quintian. M., eta Pociello E. A methodology for the joint development of the Basque WordNet and Semcor. Proceedings of the 5th International Conference on Language Resources and Evaluations (LREC), Genoa (Italia). 2006.

Agirre E., Aldezabal I., Etxeberria J., Izagirre E., Mendizabal K., Quintian. M., eta Pociello E. Eusemcor: euskarako corpora semantikoki etiketatzeko eskuliburua: editatze- etiketatz- eta epaitze-lanak. Barne-txostena, Euskal Herriko Unibertsitatea, 2005.

**Contact:** Iñaki Alegria <[i.alegria@ehu.es](mailto:i.alegria@ehu.es)>

## Computer Science Tri-lingual Corpus

**Authors:** Grzegorz Chrumpala, Ana Fernández, Elisabet Comelles, Marta Coll-Florit, Glòria Vázquez, Nerea Achutegui , Irene Castellón, Mercè Coll, Marta Prim

**References:** Grup de Recerca Interuniversitari d'Aplicacions Lingüístiques: <http://grial.uab.es>

**Description:** This corpus was developed as part of a project for teaching innovation whose objective was the improvement of the processes for teaching/learning technical English by using a new and different perspective from the traditional language class, by means of the creation of a parallel corpus. This corpus is a collection of texts available in different languages (English-Catalan-Spanish), which includes approximately 2.257.498 words and exemplifies the usage of the language within a technical register, more specifically, in the computer science domain.

This corpus is very useful for classes since it can be used as a dynamic resource in the teaching, both for the teacher and for the student. For the teacher, it can be used as a source of material for the creation of exercises, texts for the classes and examples. It can also be used as a guide to develop the class syllabus. As the corpus is annotated morphologically and syntactically, this resource is transformed into a very useful instrument for the language class, because it allows us to perform searches not only of collocations but also of words with a given category, or even of lemmas.

**Functionality:** The interface allows the simple search (form), and the advanced search (form, lemma and



POS) and the output is showed in the three languages.

**Technology:** Wrapper program (Java class) which uses external annotation software (FreeLing and Connexor) to perform annotation of the aligned text while preserving the alignment. It then formats and stores annotated segments in a specialized CPG XML format. eXist database which stores the XML-encoded text. XQuery scripts implementing specialized search functions. There are two basic search modes: *quicksearch*, for searching by sequences of word forms, and *fullsearch* for searching by sequences of token specifications including the token form, lemma and morphological annotation. The Web User Interface, in whose implementation use is made of all the major web technologies: XQuery, XSLT, CSS, XHTML and Ecmascript. The MVC Cocoon web application framework bundled with eXist is used to implement this component.

**Technical Requirements:** -

**Modules:** -

**Innovation:** Using computational linguistics techniques for the production of materials for second language learning.

**Development:** The trilingual corpus has been developed in the project: Millora de la qualitat docent de la Generalitat de Catalunya (194 MQD 2002).

**Publications:**

Castellón, I., A. Fernández, G. Vázquez (2005) "Creación de un recurso textual para el aprendizaje del inglés", *NOVATICA Revista de la Asociación de técnicos de informática*, 177, p. 51-54. ISSN: 0211-2124

**Contact:** A. M. Fernández Montraveta <[ana.fernandez@uab.es](mailto:ana.fernandez@uab.es)>

## Lexicon of Prototypical Discourse Markers

**Authors:** Laura Alonso

**References:** <http://russell.famaf.unc.edu.ar/~laura/shallowdisc4summ/discmar>

**Description:** This is the seminal discourse marker lexicon used in the thesis Representing discourse for automatic text summarization via shallow NLP techniques. The discourse markers listed here were the primary source of evidence to draw the semantic maps to obtain an inventory of basic discursive meanings. This lexicon is also the basis for the implementations of a discourse segmenter and for the discourse analysis exploited by the e-mail summarizer Carpanta.

The lexicon is parallel in three languages: Catalan, Spanish and English. Therefore, in this starting version of the lexicon we have only included those discourse markers that have a near-synonym in one of the other languages. The lexicon is formed by 84 discourse markers, representing different discursive meanings. Some discourse markers have been assigned to more or less than one meaning per dimension, because they are ambiguous or underspecified, respectively. In this lexicon, discourse markers are characterized by their structural (continuation or elaboration) and semantic (revision, cause, equality, context) meanings, and they

are also associated to a morphosyntactic class (part of speech, PoS), one of adverbial (A), phrasal (P) or conjunctive (C).

**Functionality:** The semantic information associated to discourse markers can be integrated into any tool that exploits these lexical items as source of evidence of discursive structure in texts. It has been integrated in a segmenter in discursive units and in some automatic summarizers.

**Technology:** The lexicon is in raw text.

**Technical Requirements:** -

**Modules:** -

**Innovation:** It constitutes a lexico-semantic resource that, to our knowledge, was not existing for Spanish and Catalan.

**Development:** [This lexicon represents part of the work carried out in writing the doctoral dissertation "Representing discourse for automatic text summarization via shallow NLP" by Laura Alonso.](#)

**Publications:**

Laura Alonso i Alemany, Ezequiel Andújar Hinojosa and Robert Sola Salvatierra, (2004), A framework for feature-based description of low level discourse, in *Discourse Annotation*, workshop at the ACL'04

Laura Alonso, Jennafer Shih, Irene Castellón, Lluís Padró, (2003), An Analytic Account of Discourse Markers for Shallow NLP, in *The Meaning and Implementation of Discourse Particles*, workshop held as part of the Fifteenth European Summer School in Logic, Language and Information, ESSLLI'03, 18-19 August, Vienna, Austria

**Contact:** Laura Alonso Alemany. Facultad de Matemática, Astronomía y Física. Universidad Nacional de Córdoba, Argentina.

## SENSEM Verbal DB

**Authors:** Glòria Vázquez, Ana Fernández, Laura Alonso , Irene Castellón

**References:** Grup de Recerca Interuniversitari en Aplicacions Lingüístiques (GRIAL): <http://grial.uab.es>

**Description:** The lexical database contains the most frequent 250 Spanish verbs, a total of 1000 senses. These senses are described from a syntactic and semantic perspective: semantic roles, eventive class, synonyms, and includes a mapping with the 1.5, 1.6, 2.1 and 3.0 WordNet versions. Other information provided in the lexical database has been inferred from the annotation of a journalistic corpus of over 700,000 words: examples, subcategorization patterns and semantic constructions with frequency information.

**Functionality:** The query interface displays the examples of corpus and its associated annotation. In addition, the interface displays information in a compact or expanded mode, depending on the user's needs.

**Technology:** The information is stored in a Mysql database and the interface has been developed in php.

## **Technical Requirements:** -

## **Modules:** -

**Innovation:** The database contains information that has been acquired from corpus and the examples can be consulted from database. The senses are mapping with WordNet .

**Development:** The Database has been developed with the Sensem project: *Banco de datos sintáctico y semántico del español. 2004-2006 - Ministerio de Ciencia y Tecnología (BFF2003-06456)* and at this moment it is under development thanks to the project Ampliación de la BD léxica y el corpus sintáctico-semántico de semántica oracional del español SenSem Ministerio de educación y Ciencia HUM2007-65267

## **Publications:**

Alonso, L., I. Castellón and N. Tincheva (2007). "Obtaining coarse-grained classes of subcategorization patterns for Spanish", *Proceedings of the International Conference RANLP*

Alonso,L.,I. Castellón, N. Tinkova (2007). "Adquisición de subcategorizaciones verbales mediante un clasificador automático", *Revista de la SEPLN*

Carrera J., I. Castellón, S. Climent and M. Coll-Florit (2008). "Towards Spanish verbs' selectional preferences automatic acquisition. Semantic annotation of SenSem corpus", *Proceedings of The 6th international conference on Language Resources and Evaluation, LREC 2008*. ISBN: 2-9517408-4-0

Carrera Ventura,J.T. (2007), *Análisis de técnicas de adquisición automática de restricciones selectivas*. GRIAL- Research Report 3/2007 Departament de Lingüística General. Universitat de Barcelona

Castellón, I, L. Alonso, N.T. Tincheva (2008). "A procedure to automatically enrich verbal lexica with subcategorization frames". Lawrence Mandow (ed.), *Inteligencia Artificial*. Malaga (España):, 12:37, p. 45-53. ISSN: 1137-3601

Castellón, I., A. Fernández, G. Vázquez (2005). "La semántica oracional del español: perspectiva desde el léxico". G. Wotjak, J. Cantero (ed.), *Entre semántica léxica, teoría del léxico y sintaxis*. Frankfurt:Leipzig. Peter Lang, Europaishcher Verlag der Wissenschaften, p. 113-122. ISBN: 3-631-53207-5. ISSN: 1436-1914

Castellón, I., L. Alonso and N. Tincheva (2007). "A procedure to automatically enrich verbal lexica with subcategorization frames", *Argentinean Symposium on Artificial Intelligence, ASAI'07*.

Castellón,I i A. Fernández (eds.) (2007), *Perspectivas de análisis de la unidad verbal*. Seres.. Barcelona: Publicacions i Edicions de la Universitat de Barcelona. ISBN: 978-84-475-3177-6

Coll, M. (2006). "Diferentes niveles de aspecto". WORKSHOP SERES. Universitat de Barcelona

Coll-Florit, M. (2007). "Aktionsart y polisemia verbal", *Actas del III Congreso Internacional de Lingüística Hispánica (CILHIS)*

Coll-Florit, M., S.Climent, I.Castellón (2007). "Aspecto léxico y desambiguación semántica. El caso de los estados". Ricardo Mairal Usón (ed.), *Aprendizaje de lenguas, uso del lenguaje y modelación cognitiva: perspectivas aplicadas entre disciplinas*. Madrid:. ISBN: 978-84-611-6897-2

Fernández, A., G. Vázquez, I. Castellón (2004). "Sensem: base de datos verbal del español". G. de Ita, O. Fuentes, M. Osorio (ed.), *IX Ibero-American Workshop on Artificial Intelligence, IBERAMIA*. Puebla de los Ángeles, Mexico:, p. 155-163. ISBN: 968-863-786-6

Fernández, A., G. Vázquez, I. Castellón (2006). "SenSem: a Databank for Spanish Verbs", *Proceedings of the X Ibero-American Workshop on Artificial Intelligence, IBERAMIA*.. Ribeirão Preto, Brasil

Vázquez, G., L. Alonso, J.A. Capilla, I. Castellón, A. Fernández (2006). "SenSem: sentidos verbales, semántica oracional y anotación de corpus", *Procesamiento del Lenguaje Natural*, 37, p. 113-120. ISSN: 1135-5948

**Contact:** Ana Maria Fernández Montraveta <[ana.fernandez@uab.es](mailto:ana.fernandez@uab.es)>

## SENSEM Corpus

**Authors:** Glòria Vázquez, Ana Fernández, Laura Alonso , Irene Castellón

**References:** Grup de Recerca Interuniversitari en Aplicacions Lingüístiques (GRIAL): <http://grial.uab.es>

**Description:** This corpus includes Spanish journalistic texts, more precisely, it is a collection of news extracted from *El Periódico de Catalunya*. It has been manually annotated at a syntactic ( phrases and syntactic function) and semantic level (semantic roles, semantic constructions and sense disambiguation). The corpus has approximately 700.000 words. It contains sentences with the 250 more frequent verbs in Spanish.

**Functionality:** The interface (<http://grial.uab.es/search>) allows simple and advanced searches on the corpus by different fields, including the negative search. The XML corpus can be downloaded.

**Technology:** The corpus is stored in a Mysql database and the interface has been developed in PHP.

**Technical Requirements:** -

**Modules:** -

**Innovation:** The main innovation is the amount of examples (100 examples for each verb), in addition to the syntactic and semantic annotation, since there are few corpus annotated with such information.

**Development:** The Corpus has been developed with the Sensem project: *Banco de datos sintáctico y semántico del español. 2004-2006 - Ministerio de Ciencia y Tecnología (BFF2003-06456)* and at this moment it is under development thanks to the project: *Ampliación de la BD léxica y el corpus sintáctico-semántico de semántica oracional del español SenSem Ministerio de educación y Ciencia HUM2007-65267*

**Publications:**

Alonso, L., I. Castellón, N. Tincheva (2006). "Detección automática de errores en el Corpus Sensem", Congreso de la Asociación Española de Lingüística Aplicada (AESLA)

Alonso, L., J.A. Capilla, I. Castellón, A. Fernández, G. Vázquez (2005). "The Sensem Project: Syntactico-Semantic Annotation of Sentences in Spanish", Proceedings of the International Conference RANLP, p. 39-46. Borovets, Bulgaria. ISBN: 954-91743-3-6

Alonso, L., J.A. Capilla, I. Castellón, A. Fernández, G. Vázquez (2007). "The Sensem Project: Syntactico-Semantic Annotation of Sentences in Spanish". N.Nikolov, K. Bontcheva, G. Angelova and R. Mitkov. (ed.), Recent Advances in Natural Language Processing IV. Selected papers from RANLP 2005. Current Issues in Linguistic Theory 292 John Benjamins Publishing Co, p. 89-98. ISBN: 978 90 272 4807 7

Castellón, I., A. Fernández, G. Vázquez (2005). "La semántica oracional del español: perspectiva desde el léxico". G. Wotjak, J. Cantero (ed.), Entre semántica léxica, teoría del léxico y sintaxis. Frankfurt:Leipzig. Peter Lang, Europaishcher Verlag der Wissenschaften, p. 113-122. ISBN: 3-631-53207-5. ISSN: 1436-1914

Castellón, I., A. Fernández, G. Vázquez, L. Alonso, J.A. Capilla (2006). "The Sensem Corpus: a Corpus Annotated at the Syntactic and Semantic Level", Fifth International Conference on Language Resources and Evaluation (LREC), p. 355-359

Fernández, A., G. Vázquez, D. Teruel (2006). "Interfaz de explotación del corpus SenSem", Congreso de la Asociación Española de Lingüística Aplicada (AESLA)

Fernández, A., G. Vázquez (2007). "Problemas sobre la distinción entre argumentos y adjuntos en el corpus SenSem". Castellón, I., A. Fernández (ed.), *Perspectivas de análisis de la unidad verbal*. Seres. Barcelona:Publicacions i Edicions de la Universitat de Barcelona, p. 35-48. ISBN: 978-84-475-3177-6

Fernández, A., G. Vázquez, I. Castellón (2004). "Sensem: base de datos verbal del español". G. de Ita, O. Fuentes, M. Osorio (ed.), IX Ibero-American Workshop on Artificial Intelligence, IBERAMIA. Puebla de los Ángeles, Mexico:, p. 155-163. ISBN: 968-863-786-6

Fernández, A., G. Vázquez, I. Castellón (2006). "SenSem: a Databank for Spanish Verbs", Proceedings of the X Ibero-American Workshop on Artificial Intelligence, IBERAMIA.. Ribeirão Preto, Brasil

Vázquez, G., A. Fernández (2008). "Annotation de corpus: Sur la délimitation des arguments et des adjoints", SKY Journal of Linguistics

Vázquez, G., A. Fernández, L. Alonso (2005). "Description of the Guidelines for the Syntactico-semantic Annotations of a Corpus in Spanish". Angelova, G., K. Bontcheva, R. Mitkov, N. Nicolov (ed.), International Conference Recent Advances in Natural Language. Shoumen (Bulgaria):, p. 603-607. ISBN: 954-91743-3-6

Vázquez, G., A. Fernández, L. Alonso (2005). "Description of the Guidelines for the Syntactico-semantic Annotations of a Corpus in Spanish". Angelova, G., K. Bontcheva, R. Mitkov, N. Nicolov (ed.), International Conference Recent Advances in Natural Language. Shoumen (Bulgaria):, p. 603-607. ISBN: 954-91743-3-6

Vázquez, G., L. Alonso, J.A. Capilla, I. Castellón, A. Fernández (2006). "SenSem: sentidos verbales, semántica oracional y anotación de corpus", *Procesamiento del Lenguaje Natural*, 37, p. 113-120. ISSN: 1135-5948

**Contact:** Ana Maria Fernández Montraveta <[ana.fernandez@uab.es](mailto:ana.fernandez@uab.es)>

## Volem

**Authors:** Ana Fernández, Glòria Vázquez, Irene Castellón

**References:** Grup de Recerca Interuniversitari en Aplicacions Lingüístiques (GRIAL): <http://grial.uab.es>

**Description:** VOLEM (Verbs: Multilingual Lexical Organization) is a lexical multilingual data base of a subset of Spanish, Catalan and French verbs. In this multilingual resource, subcategorization frames together with their semantics are specified for approximately 100 verbs. It also provides information regarding semantic roles, selectional restrictions and examples of use. The resource was developed by researchers of 4 groups: GRIAL (Grup de Recerca Interuniversitari en Aplicacions Lingüístiques); Informatique Linguistique et Programation en Logique, (Université Paul Sabatier); IRIT (Institut de Recherche en Informatique; IXA, Universidad del País Vasco – Euskal Herriko Unibersitatea, Filosofia eta Hezkuntza Zientzien Fakultatea; TALP, Universitat Politècnica de Catalunya, Llenguatges i Sistemes Informàtics

**Functionality:** The query interface (<http://grial.uab.es/multi/>) allows the user to carry out simple and

advanced searches with filters in order to obtain verb classes. Filtering criteria include: semantic role, type of construction, subcategorization pattern and semantic class. Queries can be made for just one language or for more than one language simultaneously (multilingual query). The menu interface allows users to select or deselect the search criteria they want to appear on the list. The interface also allows users to view the translation of the different verb senses in four languages (Catalan, Spanish, Basque and French).

**Technology:** The information is stored in a Mysql database and the interface has been developed in php.

**Technical Requirements:** -

**Modules:** -

**Innovation:** In this resource, the set of linguistic labels has been standardized so that the results obtained can be compared objectively. It is worth noting the inclusion of two minority languages, Basque and Catalan, for which the number of available resources is quite limited.

We would also like to point out the inclusion of information about selection preferences, a feature of particular interest in the field of NLP. Finally, one of the most relevant aspects of this project is the multilingual interface; users can work in several different languages to obtain information about verb behavior.

**Development:** Generalitat de Catalunya, Xarxes Temàtiques Regionals dels Pirineus (ABM/acs/XTI-CTP 2000-1, ABM/acs/XI2003-12)

**Publications:**

Fernández, A., P. Saint-Dizier, G. Vázquez, F. Benamara , M. Kamel (2002). "The VOLEM Project: a Framework for the Construction of Advanced Multilingual Lexicons", *Proceedings of the Language Engineering Conference*, p. 89-98. ISBN: 0-7695-1885-0/02

**Contact:** Ana Maria Fernández Montraveta <[ana.fernandez@uab.es](mailto:ana.fernandez@uab.es)>

## Spanish WordNet 3.0

**Authors:** Ana Fernández, Glòria Vázquez, Irene Castellón

**References:** Grup de Recerca Interuniversitari en Aplicacions Lingüístiques (GRIAL): <http://grial.uab.es>

**Description:** An open-source lexical and semantic resource for Spanish that has been created from the latest version of the English WordNet (3.0) and connected with it through the ID and the alignment of words contained in glosses and examples. It contains especially nouns and verbs. These words are annotated with morphosyntactic and semantic information.

**Functionality:** The query interface (<http://grial.uab.es/recursos/wordnet30>) displays all the information of the resource by selecting the corresponding option in the menu: definitions in Spanish and English, morphosyntactic and semantic annotation, Spanish examples and their translation into English. Moreover, the user can make queries about the variants; all queries can be done for both English and Spanish Wordnet"

**Technology:** The data are stored in a Mysql database and the interface has been developed in php.

**Technical Requirements:** -

**Modules: -**

**Innovation:** An open-source lexical and semantic resource for Spanish that contains an annotated corpus at semantic level (disambiguation of senses). Until this moment there was not an open-source Spanish version of Wordnet .

**Development:** This resource has been developed with the project “Traducción y anotación de las glosas de la Ontología WordNet 3.0 para la lengua española” Ministerio de Educación y Ciencia. HUM2006-27968-E.

**Publications:**

Fernández, A., G. Vázquez (2008). "La construcción del WordNet 3.0 en español", Actas del III Congreso Internacional de Lexicografía

Fernández-Montraveta, A., G. Vázquez, C. Fellbaum (2008). "The Spanish Version of WordNet 3.0". Storrer, A. et al. (ed.), Text Resources and Lexical Knowledge. Berlin:Mouton de Gruyter, p. 175-182. ISBN: 978-3-11-020735-4

**Contact:** Ana Maria Fernández Montraveta <[ana.fernandez@uab.es](mailto:ana.fernandez@uab.es)>

## Geo-WordNet

**Authors:** Davide Buscaldi (Ph.D. student) and Paolo Rosso

**References:** <http://www.dsic.upv.es/grupos/nle/resources/geo-wn/download.html>

**Description:** This is a semi-automatically generated mapping from WordNet 2.0 to geographical coordinates.

**Functionality:** It allows to assign a point in the map (geo-reference) to all WordNet synsets that are related to a geographical entity.

**Technology:** It was developed using a MySQL database and WordNet, however it is merely a list of WordNet synsets and their coordinates.

**Technical Requirements:** It requires WordNet 2.0 in order to be used.

**Modules: -**

**Innovation:** This is the first time that an effort is done to connect WordNet to geographical databases, therefore connecting two different type of research communities (Natural Language research groups with GIS research groups).

**Development:** Developed as part of the MiDES CICYT TIN2006-15265-C06-04 research project, co-funded by the AEI-PCI A01031707 project.

**Publications:**

Davide Buscaldi and Paolo Rosso, Geo-WordNet: Automatic Georeferencing of WordNet. In: Proceedings of the Sixth International Language Resources and Evaluation (LREC'08), Marrakech, Morocco, 2008.

**Contact:** Davide Buscaldi <[dbuscaldi@dsic.upv.es](mailto:dbuscaldi@dsic.upv.es)>

## GeoSemCor2.0

**Authors:** Davide Buscaldi (Ph.D. student) and Paolo Rosso

**References:** <http://www.dsic.upv.es/grupos/nle/resources/geosemcor2.0.tar.gz>

**Description:** This resource is the SemCor corpus labeled with WordNet 2.0 synsets, enriched with the addition of labels for synsets that are related to geographical entities.

**Functionality:** It is a corpus that can be used to evaluate Toponym Disambiguation methods.

**Technology:** It is a set of SGML-formatted files.

**Technical Requirements:** It needs WordNet 2.0 in order to be used.

**Modules:** -

**Innovation:** This is the first time that a resource aimed at the evaluation of Toponym Disambiguation is produced.

**Development:** Developed as part of the MiDES CICYT TIN2006-15265-C06-04 research project.

Publications

Davide Buscaldi and Paolo Rosso, A conceptual density-based approach for the disambiguation of toponyms. International Journal of Geographical Information Science, 22(3), pages 301-313, Taylor and Francis, 2008.

Davide Buscaldi and Paolo Rosso, Map-based vs. Knowledge-based Toponym Disambiguation., in: Proc. 5th Int. Workshop on Geographical Information Retrieval, GIR-2008, CIKM-2008, pages 19-22, 2008.

**Contact:** Davide Buscaldi <[dbuscaldi@dsic.upv.es](mailto:dbuscaldi@dsic.upv.es)>

## EmotiCorpus

**Authors:** Davide Buscaldi (Ph.D. student) and Paolo Rosso

**References:** <http://www.dsic.upv.es/grupos/nle/resources/emoticorpus.xml.bz2>

**Description:** This resource is an annotated corpus of quotes from the Italian wikiquote collection.

**Functionality:** This corpus can be used in order to carry out experiments over Automatic Humour Recognition (AHR).

**Technology:** It is a set of XML-formatted files. It was produced with a Java interface.

**Technical Requirements:** None.

**Modules:** -

**Innovation:** This is currently the only available resource for AHR in Italian.

**Development:** Developed as part of the MiDES CICYT TIN2006-15265-C06-04 research project.

**Publications:**



Davide Buscaldi and Paolo Rosso, Some Experiments in Humour Recognition Using the Italian Wikiquote Collection. Applications of Fuzzy Sets Theory, LNAI vol. 4578, Springer, pp. 464-468, 2007.

**Contact:** Davide Buscaldi <[duscaldi@dsic.upv.es](mailto:duscaldi@dsic.upv.es)>

## **ANERcorp**

**Authors:** Yassine Benajiba (Ph.D. student) and Paolo Rosso

**References:** <http://www.dsic.upv.es/grupos/nle/>

**Description:** ANERcorp is an Arabic NER corpus which consists of 150,000 tokens (which go up to 200,000 tokens after segmentation).

**Functionality:** IOB annotated Arabic NER resource.

**Technology:** The corpus was annotated by one person to ensure annotation coherence. Each named entity is tagged by its class using the IOB annotation scheme following the guidelines of the corpora used in the CoNLL 2002 and 2003 evaluation campaigns.

**Technical Requirements:** None

**Modules:** -

**Innovation:** To our knowledge, it is the only freely available Arabic NER corpus.

**Development:** Developed as part of Yassine Benajiba's AECI Ph.D. and the MiDES CICYT TIN2006-15265-C06-04 research project, co-funded by the AECI-PCI A01031707 and A706706 projects.

### **Publications:**

Benajiba Y., Rosso P. Arabic Named Entity Recognition using Conditional Random Fields. In: Proc. Workshop on HLT & NLP within the Arabic world. Arabic Language and local languages processing: Status Updates and Prospects, 6th Int. Conf. on Language Resources and Evaluation, LREC-2008, Marrakech, Morocco, May 26-31, 2008

Benajiba Y., Diab M. Rosso P. Arabic Named Entity Recognition: An SVM-based approach. In: Proc. Int. Arab Conf. on Information Technology, ACIT-2008, Hammamet, Tunisia, December, 2008.

Benajiba Y., Rosso P., Benedí J.M. ANERsys: An Arabic Named Entity Recognition system based on Maximum Entropy. In: Proc. 8th Int. Conf. on Comput. Linguistics and Intelligent Text Processing, CICLing-2007, Springer-Verlag, LNCS(4394), pp. 143-153, 2008.

**Contact:** Yassine Benajiba <[benajibayassine@gmail.com](mailto:benajibayassine@gmail.com)>

## ANERgazet

**Authors:** Yassine Benajiba (Ph.D. student) and Paolo Rosso

**References:** <http://www.dsic.upv.es/grupos/nle/>

**Description:** ANERgazet is a set of 3 Arabic gazetteers (people, locations and organizations) which might be used mainly for the Arabic NER task, but still can be used for other Arabic NLP tasks.

**Functionality:** Each gazetteer contains a list of Arabic names belonging to the concerned class.

**Technology:** The gazetteers were extracted automatically from Arabic Wikipedia and the Web resources and then manually filtered.

**Technical Requirements:** None

**Modules:** -

**Innovation:** To our knowledge, ANERgazet is the only Arabic gazetteers which are freely available to the research community.

**Development:** Developed as part of Yassine Benajiba's AECI Ph.D. and the MiDES CICYT TIN2006-15265-C06-04 research project, co-funded by the AECI-PCI A01031707 and A706706 projects.

### Publications:

Benajiba Y., Diab M., Rosso P. Arabic Named Entity Recognition using Optimized Feature Sets. In: Proc. Int. Conf. on Empirical Methods in Natural Language Processing, EMNLP-2008, Waikiki, Honolulu, U.S.A., October, 2008

Benajiba Y., Rosso P. Arabic Named Entity Recognition using Conditional Random Fields. In: Proc. Workshop on HLT & NLP within the Arabic world. Arabic Language and local languages processing: Status Updates and Prospects, 6th Int. Conf. on Language Resources and Evaluation, LREC-2008, Marrakech, Morocco, May 26-31, 2008

Benajiba Y., Diab M. Rosso P. Arabic Named Entity Recognition: An SVM-based approach. In: Proc. Int. Arab Conf. on Information Technology, ACIT-2008, Hammamet, Tunisia, December, 2008

Benajiba Y., Rosso P., Benedí J.M. ANERsys: An Arabic Named Entity Recognition system based on Maximum Entropy. In: Proc. 8th Int. Conf. on Comput. Linguistics and Intelligent Text Processing, CICLing-2007, Springer-Verlag, LNCS(4394), pp. 143-153, 2008

**Contact:** Yassine Benajiba <[benajibayassine@gmail.com](mailto:benajibayassine@gmail.com)>

## Arabic QA

**Authors:** Yassine Benajiba and Lahsen Abouenour (Ph.D. students) and Paolo Rosso

**References:** <http://www.dsic.upv.es/grupos/nle/>

**Description:** The list of documents consists of Arabic newswire articles collected from the Web. We have manually built a set of Arabic questions in order to ensure that each question has the correct answer in the documents. The proportions of the question type (factoid, list, ...) are similar to the ones used in the CLEF

2006.

**Functionality:** the three sets of data are meant to be used as a test-platform for an Arabic Question Answering system.

**Technology:** Documents: from the web, Questions and answers: manually built.

**Technical Requirements:** In order to use these data, it is required to have an Arabic Question system. It is also possible to use these data to test only some modules of the QA system (I.e. the QA system is not required to be fully built).

**Modules:** None

**Innovation:** To our knowledge, these data is the only freely available Arabic test-platform for Arabic Question Answering.

**Development:** Developed as part of Yassine Benajiba's AECI Ph.D. and the MiDES CICYT TIN2006-15265-C06-04 research project, co-funded by the AECI-PCI A01031707 and A706706 projects.

**Publications:**

Benajiba Y., Rosso P., Gómez J.M. Adapting JIRS Passage Retrieval System to the Arabic. In: Proc. 8th Int. Conf. on Comput. Linguistics and Intelligent Text Processing, CICLing-2007, Springer-Verlag, LNCS(4394), pp. 530-541, 2007

Abouenour L., Bouzoubaa K., Rosso P. Improving Q/A using Arabic WordNet. In: Proc. Int. Arab Conf. on Information Technology, ACIT-2008, Hammamet, Tunisia, December, 2008

Abouenour L., Bouzoubaa K., Rosso P. Construction de l'ontologie Amine Arabic WordNet dans le cadre des systèmes Q/A. (in French) In: Proc. 2nd Journées Scientifiques en Technologies de l'Information et de la Communication JOSTIC-2008, Rabat, Marroco, October, 2008

Abouenour L., Bouzoubaa K., Rosso P. Towards an Arabic Q/A system using a conceptual/lexical ontology. (in Arabic) In: Proc. Proc. 5th Conf. on Scientific Research Outlook & Technology Development in the Arab world, SROV, Fez, Marroco, October, 11-16, 2008

**Contact:** Yassine Benajiba <[benajibayassine@gmail.com](mailto:benajibayassine@gmail.com)>

## Cross-Lingual Plagiarism Corpus

**Authors:** Luis Alberto Barrón Cedeño (Ph.D. student) and Paolo Rosso

**References:** <http://www.dsic.upv.es/grupos/nle/downloads.html>

**Description:** The CliPA corpus has been created as a resource for the design and test of methods for the automatic detection of cross-lingual plagiarism cases. It contains a set of original text fragments in English and around twelve different plagiarised versions of them in Spanish (Italian will be added soon). The plagiarised text fragments were obtained by both "human plagiarisers" and Machine Translators. In order to create a realistic plagiarism detection environment, the corpus includes a set of text fragments on the same topic but originally written in Spanish.

**Functionality:** Due to the facts that all the text fragments in the corpus are identified as original or plagiarised and that the plagiarised fragments are linked to their actual source, the corpus can be used to develop and test cross-lingual plagiarism detection methods.

**Technology:** The corpus is codified in XML.

**Technical Requirements:** There are not special requirements to use the corpus. It can be accessed via any XML parser.

**Innovation:** To our knowledge, With respect, CLiPA corpus is the only freely available corpus cross-lingual plagiarism analysis.

**Development:** Developed as part of the MiDES CICYT TIN2006-15265-C06-04 research project.

**Publications:**

Barrón-Cedeño A., Rosso, P., Pinto, D. and Juan, A. On cross-lingual plagiarism analysis using a statistical model. In: Proceedings of the ECAI'08 PAN Workshop: Uncovering Plagiarism, Authorship and Social Software Misuse, pp. 9-13. Patras, Greece, 2008.

Pinto D., Civera J., Juan A., Rosso P., Barrón-Cedeño A. A statistical approach to crosslingual natural language tasks. In: Proc. 4th Latin American Workshop on Non-Monotonic Reasoning, LANMR-2008, Puebla, Mexico, October 22-24, 2008

Pinto D., Civera J., Barrón-Cedeño A., Juan A., Rosso P. A statistical approach to crosslingual natural language tasks (selected and enhanced version; accepted and to be published). In: Journal of Algorithms in Cognition, Informatics and Logic, 2009

**Contact:** Luis Alberto Barrón Cedeño <[lbarron@dsic.upv.es](mailto:lbarron@dsic.upv.es)>

## **CICLing-2002 Clustering Corpus**

**Authors:** Mikhail Alexandrov and Alexander Gelbukh (Instituto Politécnico Nacional, Mexico). Pre-processed by David Pinto; Héctor Jiménez (Universidad Autónoma Metropolitana, México)

**References:** <http://www.dsic.upv.es/grupos/nle/downloads.html>

**Description:** This a pre-processed version of 48 scientific abstracts from the [CICLing 2002](#) conference (computational linguistics).

**Functionality:** The aim of this corpus is to support experiments of supervised and unsupervised classifiers with narrow domain short texts.

**Technology:** The corpus (raw text) and the gold standard are provided.

**Technical Requirements:** No special requirements are needed in order to use the corpus.

**Innovation:** A very small collection which may be used to manually verify the results obtained in the clustering task of narrow domain short texts.

**Development:** Developed as part of David Pinto Ph.D. and the MiDES CICYT TIN2006-15265-C06-04 research project.

**Publications:**

David Pinto, Alfons Juan, Paolo Rosso: A Comparative Study of Clustering Algorithms on Narrow-Domain Abstracts. *Procesamiento del Lenguaje Natural* 37(1): 43-49, 2006

Héctor Jiménez-Salazar, David Pinto, Paolo Rosso: Uso del Punto de Transición en la Selección de Términos Índice para Agrupamiento de Textos Cortos, *Procesamiento del Lenguaje Natural* 35(1): 114-118, 2005

Diego Ingaramo, David Pinto, Paolo Rosso, Marcelo Errecalde: Evaluation of Internal Validity Measures in Short-Text Corpora. *CICLing 2008. Lecture Notes in Computer Science* 4919, Springer-Verlag: 555-567, 2008

David Pinto, Paolo Rosso: On the Relative Hardness of Clustering Corpora. *TSD 2007. Lecture Notes in Artificial Intelligence* 4629, Springer-Verlag: 155-161, 2007

David Pinto, José-Miguel Benedí, Paolo Rosso: Clustering Narrow-Domain Short Texts by Using the Kullback-Leibler Distance. *CICLing 2007. Lecture Notes in Computer Science* 4394, Springer-Verlag: 611-622, 2007

David Pinto, Héctor Jiménez-Salazar, Paolo Rosso: Clustering Abstracts of Scientific Texts Using the Transition Point Technique. *CICLing 2006. Lecture Notes in Computer Science* 3878, Springer-Verlag: 536-546, 2006

**Contact:** David Eduardo Pinto Avendaño <[dpinto@cs.buap.mx](mailto:dpinto@cs.buap.mx)>

## Single-label hep-ex Clustering Corpus

**Authors:** Alfonso Ureña López and Arturo Montejo Ráez (Universidad Jaén). Pre-processed by David Pinto; Héctor Jiménez (Universidad Autónoma Metropolitana, México)

**References:** <http://www.dsic.upv.es/grupos/nle/downloads.html>

**Description:** This corpus is a pre-processed version of the collection of scientific abstracts compiled by the University of Jaén, Spain named hep-ex [1].

**Functionality:** The aim of the pre-processed version of this corpus is to support experiments of supervised and unsupervised classifiers with narrow domain short texts.

**Technology:** The corpus (raw text) and the gold standard are provided.

**Technical Requirements:** No special requirements are needed in order to use the corpus.

**Innovation:** A relatively big pre-processed collection which may be used to experiment with different clustering methods on the narrow domain short-text clustering task.

**Development:** Developed as part of David Pinto Ph.D. and the MiDES CICYT TIN2006-15265-C06-04 research project.

### Publications:

Arturo Montejo-Ráez, Luis Alfonso Ureña-López, Ralf Steinberger; Text Categorization using bibliographic records: beyond document content. *Procesamiento del Lenguaje Natural*, n° 35, Septiembre 2005

David Pinto, Alfons Juan, Paolo Rosso: A Comparative Study of Clustering Algorithms on Narrow-Domain Abstracts. *Procesamiento del Lenguaje Natural* 37(1): 43-49, 2006

Héctor Jiménez-Salazar, David Pinto, Paolo Rosso: Uso del Punto de Transición en la Selección de Términos Índice para Agrupamiento de Textos Cortos, *Procesamiento del Lenguaje Natural* 35(1): 114-118, 2005

David Pinto, José-Miguel Benedí, Paolo Rosso: Clustering Narrow-Domain Short Texts by Using the Kullback-Leibler Distance. CICLing 2007. Lecture Notes in Computer Science 4394, Springer-Verlag: 611-622, 2007

David Pinto, Héctor Jiménez-Salazar, Paolo Rosso: Clustering Abstracts of Scientific Texts Using the Transition Point Technique. CICLing 2006. Lecture Notes in Computer Science 3878, Springer-Verlag:536-546, 2006

**Contact:** David Eduardo Pinto Avendaño <[dpinto@cs.buap.mx](mailto:dpinto@cs.buap.mx)>

## The KnCr clustering corpus

**Authors:** David Pinto

**References:** <http://www.dsic.upv.es/grupos/nle/downloads.html>

**Description:** This is a new narrow-domain short text corpus in the medicine domain which was constructed by downloading the last sample of documents provided in MEDLINE and selecting only those which are related with the "Cancer" domain.

**Functionality:** The aim of this corpus is to support experiments of supervised and unsupervised classifiers with narrow domain short texts, specifically in the medicine field, with documents related with the "cancer" topic.

**Technology:** The corpus (raw text) and the gold standard are provided.

**Technical Requirements:** No special requirements are needed in order to use the corpus.

**Innovation:** To our knowledge, no other corpus of cancer domain has been constructed in order to be used in the categorization task.

**Development:** Developed as part of David Pinto Ph.D. and the MiDES CICYT TIN2006-15265-C06-04 research project.

### Publications:

David Pinto, Paolo Rosso: KnCr: A Short-Text Narrow-Domain Sub-Corpus of Medline. TLH 2006. Advances in Computer Science: 266-269, 2006

David Pinto, Alfons Juan, Paolo Rosso: A Comparative Study of Clustering Algorithms on Narrow-Domain Abstracts. Procesamiento del Lenguaje Natural 37(1): 43-49, 2006

David Pinto, José-Miguel Benedí, Paolo Rosso: Clustering Narrow-Domain Short Texts by Using the Kullback-Leibler Distance. CICLing 2007. Lecture Notes in Computer Science 4394, Springer-Verlag: 611-622, 2007

David Pinto: On Clustering of Narrow Domain Short-Text Corpora. PhD Thesis, Universidad Politécnica de Valencia, Spain, July 2008.

**Contact:** David Eduardo Pinto Avendaño <[dpinto@cs.buap.mx](mailto:dpinto@cs.buap.mx)>

## The Arabic Wikipedia XML corpus

**Authors:** David Pinto(R30 version) and Ludovic Denoyer and Patrick Gallinari

**References:** <http://www.dsic.upv.es/grupos/nle/downloads.html>

**Description:** The 30 most frequent categories of the Arabic Wikipedia XML corpus gathered by [Ludovic Denoyer and Patrick Gallinari](#) were selected in order to provide a testbed for the single-label categorization task in the Arabic language.

**Functionality:** The aim of this corpus is to support experiments of supervised and unsupervised classifiers with Arabic-written texts. The gold standard is provided, as well as the tokenized and untokenized versions of this corpus.

**Technology:** The corpus (raw text of tokenized and untokenized versions) and the gold standard are provided.

**Technical Requirements:** No special requirements are needed in order to use the corpus.

**Innovation:** This is an attempt to provide easy access to pre-processed texts in order to be used in the Arabic categorization task.

**Development:** Developed as part of David Pinto Ph.D. and the MiDES CICYT TIN2006-15265-C06-04 research project.

### Publications:

David Pinto: On Clustering of Narrow Domain Short-Text Corpora. PhD Thesis, Universidad Politécnica de Valencia, Spain, July 2008.

David Pinto, Paolo Rosso, Yassine Benajiba, Anas Ahachad, Héctor Jiménez-Salazar: Word Sense Induction in the Arabic Language: A Self-Term Expansion Based Approach. The Egyptian Society of Language Engineering (ESOLE): 235-245, 2007.

**Contact:** David Eduardo Pinto Avendaño <[dpinto@cs.buap.mx](mailto:dpinto@cs.buap.mx)>

## Blogs Clustering Corpus

**Authors:** Daniel Pérez (M.Sc. student) and David Pinto

**References:** <http://www.dsic.upv.es/grupos/nle/downloads.html>

**Description:** This is a set of corpora made up of discussion lines extracted from two blogs websites: boing-boing and slashdot.

**Functionality:** The aim of this corpus is to support experiments of supervised and unsupervised classifiers with narrow domain short texts, specifically in the medicine field, with documents related with the “cancer” topic.

**Technology:** The corpus (raw-text blogs) and the gold standard are provided. The discussion lines are intended as categories or classes of the gold standard, whereas posts are the target documents.

**Technical Requirements:** No special requirements are needed in order to use the corpus.

**Innovation:** The aim of this corpus is to manually verify the results of different classifiers on the blogs clustering task.

**Development:** Developed as part of David Pinto Ph.D. and the MiDES CICYT TIN2006-15265-C06-04 research project.

**Contact:** David Eduardo Pinto Avendaño <[dpinto@cs.buap.mx](mailto:dpinto@cs.buap.mx)>



## 2. Analizadores, Etiquetadores, Clasificadores

### FreeLing

**Authors:** TALP

**References:** <http://www.lsi.upc.edu/~nlp/freeling>

**Description:** The FreeLing package is a library providing language analysis services. FreeLing is designed to be used as an external library from any application requiring this kind of services. This language analysis tool suite is released under the GNU General Public License of the Free Software Foundation.

**Functionality:** The main services offered by FreeLing library are: Text tokenization; Sentence splitting; Morphological analysis; Suffix treatment, retokenization of clitic pronouns; Flexible multiword recognition; Contraction splitting; Probabilistic prediction of unknown word categories; Named entity detection; Recognition of dates, numbers, ratios, currency, and physical magnitudes (speed, weight, temperature, density, etc.); PoS tagging; Chart-based shallow parsing; Named entity classification; WordNet based sense annotation; and Rule-based dependency parsing .

Most of these services are provided for all currently supported languages: Spanish, Catalan, Galician, Italian, and English.

**Technology:** C++

**Technical Requirements:** A typical Linux box with usual development tools: bash, make, and a C++ compiler with basic STL support. Enough hard disk space (about 120Mb) Some external libraries are required to compile FreeLing:

- libpcre (version 4.3 or higher): Perl C Regular Expressions. Included in most usual Linux distributions. You'll need binary and development packages.
- libdb (version 4.1.25 or higher): Berkeley DB. Included in all usual Linux distributions.
- libcfg+ (version 0.6.1 or higher): Configuration file and command-line options management. May not be in your linux distribution.
- Omlet & Fries (libomlet v.0.97 or later, libfries v.0.95 or later): Machine Learning utility libraries, used by Named Entity Classifier. Installation scrips are not very clever yet, so these libraries are required even if you do not plan to use the NEC ability of FreeLing. Available from <http://www.lsi.upc.edu/~nlp/omlet+fries>

**Modules:** The main processing classes in the library are: 1) tokenizer: Receives plain text and returns a list of word objects; 2) splitter: Receives a list of word objects and returns a list of sentence objects; 3) maco: Receives a list of sentence objects and morphologically annotates each word object in the given sentences. Includes specific submodules (e.g, detection of date, number, multiwords, etc.) which can be activated at will; 4) tagger: Receives a list of sentence objects and disambiguates the PoS of each word object in the given sentences; 5) parser: Receives a list of sentence objects and associates to each of them a parse\_tree object; 6) dependency: Receives a list of parsed sentence objects associates to each of them a dep\_tree object.

**Innovation:** -

**Development:** FreeLing was originally written by people in TALP Research Center at Universitat Politècnica de Catalunya. Spanish and Catalan linguistic data were originally developed by people in CLiC, Centre de Llenguatge i Computació at Universitat de Barcelona. Many people further contributed to it by

reporting problems, suggesting various improvements, submitting actual code or extending linguistic databases (see web page).

### **Publications:**

Jordi Atserias and Bernardino Casas and Elisabet Comelles and Meritxell Gonzàlez and Lluís Padró and Muntsa Padró. FreeLing 1.3: Syntactic and semantic services in an open-source NLP library Proceedings of the fifth international conference on Language Resources and Evaluation (LREC 2006), ELRA. Genoa, Italy. May, 2006.

Jordi Atserias and Elisabet Comelles and Aingeru Mayor. TXALA un analizador libre de dependencias para el castellano. Procesamiento del Lenguaje Natural, n. 35, pg. 455--456. September, 2005.

Jordi Atserias and Josep Carmona and Irene Castellón and Sergi Cervell and Montserrat Civit and Lluís Màrquez and Ma Antònia Martí and Lluís Padró and Roberto Placer and Horacio Rodríguez and Mariona Taulé and Jordi Turmo. Morphosyntactic Analysis and Parsing of Unrestricted Spanish Text Proceedings of the 1st International Conference on Language Resources and Evaluation, LREC, pg. 1267--1274. Granada, Spain. May, 1998.

José Carmona and Sergi Cervell and Lluís Màrquez and Ma Antònia Martí and Lluís Padró and Roberto Placer and Horacio Rodríguez and Mariona Taulé and Jordi Turmo. An Environment for Morphosyntactic Processing of Unrestricted Spanish Text Proceedings of the 1st International Conference on Language Resources and Evaluation, LREC, pg. 915--922. Granada, Spain. May, 1998.

Xavier Carreras and Lluís Padró. A Flexible Distributed Architecture for Natural Language Analyzers Proceedings of the 3rd International Conference on Language Resources and Evaluation, LREC,

Las Palmas de Gran Canaria, Spain. 2002.

Xavier Carreras and Isaac Chao and Lluís Padró and Muntsa Padró. FreeLing: An Open-Source Suite of Language Analyzers Proceedings of the 4th International Conference on Language Resources and Evaluation (LREC'04), 2004.

**Contact:** Lluís Padró <[padro@lsi.upc.edu](mailto:padro@lsi.upc.edu)>

## **LangIdent**

**Authors:** Muntsa Padró

**References:** [http://www.lsi.upc.edu/~nlp/tools/lang\\_ident.tar.gz](http://www.lsi.upc.edu/~nlp/tools/lang_ident.tar.gz)

**Description:** LangIdent is a Markov-Model based language identifier under GPL license.

**Functionality:** -

**Technology:** C++

**Technical Requirements:** -

**Modules:** Compiling the program creates a module "idioma.o" you can link to your main program. Two executables are also created: a sample main program that illustrates the usage of the language identifier and the program to train new models.

**Innovation:** Comparing the Markov-Model technique to other techniques, it has the best performance.

Nevertheless, the usage of this technique for language identification is not new.

**Development:** In the framework of the ALIADO project.

**Publications:**

Muntsa Padró and Lluís Padró. Comparing Methods for Language Identification. *Procesamiento del Lenguaje Natural*, n. 33, pg. 155--162. September, 2004.

**Contact:** Muntsa Padró <[mpadro@lsi.upc.edu](mailto:mpadro@lsi.upc.edu)>

## SVMTool

**Authors:** Jesús Giménez and Lluís Màrquez

**References:** <http://www.lsi.upc.edu/~nlp/SVMTool>

**Description:** A simple, flexible, and effective generator of sequential taggers based on Support Vector Machines. We have applied the SVMTool to the problem of part-of-speech tagging. By means of a rigorous experimental evaluation, we conclude that the proposed SVM-based tagger is robust and flexible for feature modelling (including lexicalization), trains efficiently with almost no parameters to tune, and is able to tag thousands of words per second, which makes it really practical for real NLP applications. Regarding accuracy, the SVM-based tagger significantly outperforms the TnT tagger exactly under the same conditions, and achieves a very competitive accuracy of 97.2\% for English on the Wall Street Journal corpus, which is comparable to the best taggers reported up to date. It has been also successfully applied to Spanish and Catalan exhibiting a similar performance, and to other tagging problems such as base phrase chunking.

**Functionality:** -

**Technology:** Perl / C++

**Technical Requirements:** -

**Modules:** SVM Learning, SVM Tagger

**Innovation:** Fast and accurate (state-of-the-art) part-of-speech tagging.

**Development:** -

**Publications:**

Jesús Giménez and Lluís Màrquez. Fast and Accurate Part-of-Speech Tagging: The SVM Approach Revisited. In *Proceedings of the International Conference RANLP - 2003 (Recent Advances in Natural Language Processing)*, pages 158 - 165. September, 10-12, 2003. Borovets, Bulgaria. (ISBN 954-90906-6-3). Selected as a chapter in RANLP 2003 volume in CILT series (Current Issues in Linguistic Theory). John Benjamins Publishers, Amsterdam.

Jesús Giménez and Lluís Màrquez. SVMTool: A general POS tagger generator based on Support Vector Machines. In *Proceedings of the 4th International Conference on Language Resources and Evaluation (LREC'04)*, vol. I, pages 43 - 46. Lisbon, Portugal, 2004. (ISBN 2-9517408-1-6). Departament Research Report (LSI-04-34-R), Technical University of Catalonia, 2004.

**Contact:** Jesús Giménez <[jgimenez@lsi.upc.edu](mailto:jgimenez@lsi.upc.edu)>

## SwiRL

**Authors:** Mihai Surdeanu

**References:** <http://www.surdeanu.name/mihai/swirl/>

**Description:** SwiRL is a Semantic Role Labeling (SRL) system for English constructed on top of the full syntactic analysis of text. Achieved state-of-the-art performance in the CoNLL 2005 SRL evaluation.

**Functionality:** -

**Technology:** C++

**Technical Requirements:** Charniak Parser (included), Xavi Carreras' AdaBoost library (included).

**Modules:** Semantic Role Labeler

**Innovation:** It has state-of-the-art performance: currently its F1 on the WSJ corpus is 77+, and on the Brown corpus it is 66+ points. SwiRL ranks fifth among the systems that participated at the CoNLL 2005 shared task evaluation, but all the systems that scored higher were actually combinations of several individual models.

**Development:** -

**Publications:**

Mihai Surdeanu and Jordi Turmo, "Semantic Role Labeling Using Complete Syntactic Analysis", CoNLL Shared Task 2005.

**Contact:** Mihai Surdeanu <[mihai@surdeanu.name](mailto:mihai@surdeanu.name)>

## BIOS

**Authors:** Mihai Surdeanu

**References:** <http://www.surdeanu.name/mihai/bios/>

**Description:** Suite of Syntactico-Semantic Analyzers. Includes a named-entity recognizer, a syntactic chunker, a POS tagger, and a "smart" tokenizer. All processors are learned using the MiLL machine learning library (see below).

**Functionality:** -

**Technology:** Java

**Technical Requirements:** MiLL machine learning library, TnT tagger, YamChA.

**Modules:** Smart tokenizer that recognizes abbreviations, SGML tags etc.; Part-of-speech (POS) tagger. The POS tagger is implemented as a wrapper around the TNT tagger by Thorsten Brants; Syntactic chunking using the labels promoted by the CoNLL chunking evaluations; Named-Entity Recognition and Classification (NERC) for the CoNLL entity types plus an additional 11 numerical entity types.

**Innovation:** -

**Development:** -

**Publications:** -

**Contact:** Mihai Surdeanu <[mihai@surdeanu.name](mailto:mihai@surdeanu.name)>

## Jointparser

**Authors:** Xavier Lluís

**References:** <http://www.lsi.upc.edu/~xlluis/jointparser>

**Description:** Jointparser is a data-driven parser that jointly performs both syntactic dependency parsing and shallow semantic parsing. The system is based on an extension of the Eisner algorithm and uses an online averaged perceptron as a learning method. Shallow semantic parsing is performed for nominal and verbal predicates. The system was presented in the context of the CoNLL-2008 shared task.

**Functionality:** Noun Phrase and Verbal Phrase identification, joint syntactic and semantic analysis (on-line for english sentences)

**Technology:** C++, web interface

**Technical Requirements:** Included svmLight ([svmlight.joachims.org](http://svmlight.joachims.org)).

**Modules:** -

**Innovation:** It was one of the two novel joint syntactic-semantic parsers presented at the CoNLL-2008 shared task. It achieved a reasonable performance given it is a built-from-scratch system.

**Development:** Xavier Lluís master's thesis (UPC 8/9/2008).

**Publications:**

Xavier Lluís and Lluís Márquez, A Joint Model for Parsing Syntactic and Semantic Dependencies, Proceedings of CoNLL-2008, 2008.

Xavier Lluís, advisor: Lluís Márquez, Joint Learning of Syntactic and Semantic Dependencies, Master's thesis, Technical University of Catalonia, 2008.

**Contact:** Xavier Lluís <[xlluis@lsi.upc.edu](mailto:xlluis@lsi.upc.edu)>

## MOSTAS

**Authors:** Ana Iglesias, Elena Castro, Rebeca Pérez, Leonardo Castaño and Paloma Martínez (Universidad Carlos III de Madrid)

**References:** Advanced Databases Group (Labda) of Universidad Carlos III de Madrid is a research group with an extensive activity in several Natural Language Processing and Information Retrieval projects: <http://basesdatos.uc3m.es/index.php?id=202&L=0>

**Description:** The MOSTAS system (MORpho-Semantic Tagger, Anonymizer and SpellChecker for biomedical texts) preprocesses Clinical Reports in order to facilitate information retrieval tasks (clinical concepts, abbreviations, entities, etc.). MOSTAS system annotates clinical reports with morpho-semantic information, applies abbreviation and acronyms conversions and detects biomedical concepts using specialized biomedical resources (databases, thesaurus, a multilingual terminology server, etc.). Moreover, MOSTAS is able to anonymize and correct the clinical reports.

**Functionality:** MOSTAS preprocesses semi-structured information from clinical reports, tagging the clinical texts with specialized information, eliminating sensible information from patients and detecting if there are spellchecker errors.

**Technology:** The system is implemented in Java, suitable for being installed in Linux and Windows platforms.

**Technical Requirements:** Currently, STILUS<sup>1</sup> is used as morpho-semantic tagger. Biomedical resources are needed also, as the SNOMED<sup>2</sup> thesaurus, the list of abbreviations and acronyms provided by the Spanish Ministry of Health and Consume<sup>3</sup> among others. Moreover, Java is necessary for its compilation and execution.

**Modules:** The system is divided mainly in five different modules. Three of them deal with the pre-processing phase of the clinical reports: the Morpho-semantic Analyzer, the Acronym/Abbreviation Finder and the Biomedical Concept Finder. The other two modules deal with a post-processing of the text: a domain-specific Spell-checker and Anonymizing module where sensible information of the patients is eliminated from the clinical texts.

**Innovation:** MOSTAS is a complete system that permits to tag clinical texts, anonymize them and detect and correct spellchecker errors. This system works with semi-structured texts in Spanish. Nowadays, most of the research in this area is done in English, so MOSTAS is the first complete system in Spanish. Moreover, MOSTAS implements a biomedical resource similar to English METAMAP for UML but for the Spanish SNOMED thesaurus.

**Development:** MOSTAS has been developed during the ISSE project<sup>4</sup> and the result of different PHD works in LABDA have been taken into account, as the SPINDEL system.

#### **Publications:**

Ana Iglesias, Elena Castro, Rebeca Pérez, Leonardo Castaño, Paloma Martínez, José Manuel Gómez Pérez, Sandra Kohler y Ricardo Melero. MOSTAS: Un Etiquetador Morfo-Semántico, Anonimizador y Corrector de Historiales Clínicos. XXIV edición del Congreso Anual de la Sociedad Española para el Procesamiento del Lenguaje Natural 2008 (SEPLN' 08). Vol. 41, Pp. 299-300.

**Contact:** Ana M<sup>a</sup> Iglesias Maqueda <aiglesia@inf.uc3m.es>

---

<sup>1</sup> A grammatical and style checker developed by Daedalus, <http://www.daedalus.es>

<sup>2</sup> <http://www.snomed.org/>

<sup>3</sup> Provided by the Spanish Ministry of Health and Consume  
<http://www.msc.es/estadEstudios/estadisticas/docs/diccionarioSiglasMedicas.pdf>

<sup>4</sup> FIT-350300-2007-75 (Semantic Interoperability in Electronic Health Care)

## Eustagger

Authors: IXA group

**References:** <http://ixa2.si.ehu.es/demo/analisisimorf.jsp>

**Description:** Eustagger is a robust and wide-coverage morphological analyser and a Part-of-Speech tagger for Basque.

The analyser is based on the two-level formalism and has been designed in an incremental way with three main modules: the standard analyser, the analyser of linguistic variants, and the analyser without lexicon which can recognize word-forms without having their lemmas in the lexicon. Using lexical transducers for our analyser we have improved both the performance of the different components of the system and the description itself. Provides possible lemmas, PoS and other morphological information for a token. It also recognizes date/time expressions, numbers.

In the tagger combination of stochastic and rule-based disambiguation methods are applied to Basque language. The methods we have used in disambiguation are Constraint Grammar formalism and an HMM based tagger. CG rules are applied using all the morphological features and this process decreases morphological ambiguity of texts. Finally, we use the stochastic tool to select just one from the possible remaining tags. Using only the stochastic method the error rate is about 14%, but the accuracy may be increased by about 2% enriching the lexicon with the unknown words. When both methods are combined, the error rate of the whole process is 3.5%.

**Functionality:** Tokenization, morphological analysis, lemmatization and tagging for Basque. There is a web service.

**Technology:** C++ using FSM technology from Xerox and CG library from Connexor

**Technical Requirements:** -

**Modules:** 4 main modules: tokenizer, morphological analyzer, rule-based disambiguation and HMM based disambiguation.

**Innovation:** Is the analyzer/tagger for Basque.

**Development:** Different projects funded by the Basque government and the Spanish R&D agency.

**Publications:**

Alegria I., Artola X., Sarasola K., Urkia M. 1996. Automatic morphological analysis of Basque Literary & Linguistic Computing Vol. 11, No. 4, 193-203. Oxford University Press. Oxford.

Alegria I., Aranzabe M., Ezeiza A., Ezeiza N., Urizar R. 2002 Robustness and customisation in an analyser/lemmatiser for Basque. LREC-2002 Customizing knowledge in NLP applications Workshop.

Aduriz I., Alegria I., Arriola J.M., Urizar R. 1998. Combining Stochastic and Rule-Based Methods for Disambiguation in Agglutinative Languages COLING-ACL'98, Montreal (Canada). August 10-14, 1998.

**Contact:** Iñaki Alegria <[i.alegria@ehu.es](mailto:i.alegria@ehu.es)>

## Eihera

**Authors:** IXA group

**References:** <http://ixa2.si.ehu.es/demo/entitateak.jsp>

**Description:** Eihera is a system for Named Entity recognition and classification in written Basque. The system is designed in four steps: first, the development of a recognizer based on linguistic information represented on finite-state-transducers; second, the generation of semi-automatically annotated corpora from the result of these transducers; third, the achievement of the best possible recognizer by training different ML techniques on these corpora; and finally, the combination of the different recognizers obtained.

**Functionality:** Included in Zatiak

**Technology:** Finite-state and Machine learning.

**Technical Requirements:** -

**Modules:** Recognition by rules, recognition by ML, classification by rules, classification by ML. Eustagger is a previous step.

**Innovation:** It is the first NERC system for Basque.

**Development:** Different projects funded by the Basque government and the Spanish R&D agency.

**Publications:**

Alegria I., Arregi O., Ezeiza N., Fernandez I., Urizar R. Design and Development of a Named Entity Recognizer for an Agglutinative Language. First International Joint Conference on NLP (IJCNLP-04). Workshop on Named Entity Recognition. 2004.

Alegria I., Ezeiza N., Fernandez I., Urizar R. Named Entity Recognition and Classification for texts in Basque. II Jornadas de Tratamiento y Recuperación de Información, JOTRI, Madrid. 2003. ISBN 84-89315-33-7. 2003.

**Contact:** Iñaki Alegria <[i.alegria@ehu.es](mailto:i.alegria@ehu.es)>

## IXAti

**Authors:** IXA group. Propiedad intelectual: SS-78-08

**References:** <http://ixa2.si.ehu.es/demo/zatiak.jsp>

**Description:** Zatiak performs shallow syntactic analysis of a sentence. This program reads an input text and, after morphological processing, identifies pieces of text (chunks). Each chunk is marked with its type: nominal phrase (NP or PP) or verb chain, together with its associated information: grammatical case, number, definiteness and syntactic functions, among others.

**Functionality:** Chunking for Basque. There is a web service.

**Technology:** -

**Technical Requirements:** -



**Modules:** Modules for entities (Eihera) and postpositions are included. Eustagger is a previous step.

**Innovation:** It is the first chunker for Basque.

**Development:** Different projects funded by the Basque government and the Spanish R&D agency.

**Publications:**

Aldezabal I., Gojenola K., Sarasola K. A Bootstrapping Approach to Parser Development International Workshop on Parsing Technologies (IWPT2000). Trento. 2000

Aranzabe M., Arriola J.M., Díaz de Ilarraza A. Towards a Dependency Parser of Basque. Proceedings of the Coling 2004 Workshop on Recent Advances in Dependency Grammar. Geneva, Switzerland. 2004

**Contact:** Iñaki Alegria <[i.alegria@ehu.es](mailto:i.alegria@ehu.es)>

## Mendekotasunak

**Authors:** IXA group

**References :**

**Description:** A dependency parser we establish the dependency-based grammatical relations (subject, object, modifier, etc.) between the components within the clause in order to obtain a dependency syntactic tree. Such a deep analysis is used to improve the output of the shallow parsing where syntactic structure ambiguity is not fully and explicitly resolved. Previous to the completion of the grammar for the dependency parsing, the design of the Dependency structure-based scheme is accomplished.

**Functionality:** Dependency parser for Basque

**Technology:** -

**Technical Requirements:** -

**Modules:** Ixati is a previous step.

**Innovation:** It is the first dependency parser for Basque.

**Development:** -

**Publications:**

Aranzabe M., Arriola J.M., Díaz de Ilarraza. 2004. Towards a Dependency Parser of Basque Proceedings of the Coling 2004 Workshop on Recent Advances in Dependency Grammar. Geneva, Switzerland.

**Contact:** Iñaki Alegria <[i.alegria@ehu.es](mailto:i.alegria@ehu.es)>

## WSD-IXA

**Authors:** IXA group and Asier Gabiola

**References:** <http://ixa3.si.ehu.es/wsd-demo>

**Description:** The WSD system is based on the well known Support Vectors Machine (SVM) Algorithm. This system has been trained on EuSemCor corpus (the unique basque corpus semantically tagged). Due to corpus's reduced size, the WSD system has been trained for 402 polysemous nouns.

**Functionality:** Perl CGI script runs the input raw text over Eustagger basque lemmatizer in order to extract features. Then, the feature-vector is classified by the WSD (SVM) system. Finally, the CGI manage classifier and lemmatizer output in order to show in a proper format.

**Technology:** C, C++, Perl

**Technical Requirements:** -

**Modules:** Perl CGI script, EusSemcor data base (MySQL), Eustagger, SVM-light

**Innovation:** First online WSD system for Basque

**Development:** -

**Publications:**

Agirre E., and Martinez D.2004. The Basque Country University system: English and Basque tasks..Proceedings of the 3rd ACL workshop on the Evaluation of Systems for the Semantic Martinez D. 2005

Supervised Word Sense Disambiguation: Facing Current Challenges. SEPLN Journal. Vol. 34. pgs 125-126.

**Contact:** Iñaki Alegria <[i.alegria@ehu.es](mailto:i.alegria@ehu.es)>

## Dependency Grammar for Catalan

**Authors:** Jordi Carrera, Marina Lloberas, Nevena Tincova, Irene Castellón

**References:** Grup de Recerca Interuniversitari d'Aplicacions Lingüístiques (in collaboration with TALP – UPC): <http://grial.uab.es>, <http://garraf.epsevg.upc.es/freeling>

**Description:** Catalan dependency grammar consists of a set of 2,914 rules, of which 2,565 complete the parse tree by creating dependencies and the remaining 349 label these dependencies. Catalan grammar treats dependency recursion and dependency relations between phrases, clauses headed by conjunctions or relative pronouns, non-finite clauses and punctuation marks.

**Functionality:** Dependency parsing

**Technology:** The grammar is included in Freeling <http://www.lsi.upc.edu/~nlp/freeling>

**Technical Requirements:** It has to be downloaded with Freeling.

**Modules:** -

**Innovation:** Wide-coverage deep parsing grammar for Catalan

**Development:** This grammar has been developed in the KNOW project . Ministerio de Educación y Ciencia (TIN2006-1549-C03-02)

**Publications:**

J.Carrera, I. Castellón, M.Lloberes, L.I.Padró, N. Tincova (2008). "Dependency Grammars in Freeling", *Procesamiento del Lenguaje Natural*, 2008:41, p. 13-20. ISSN: 1135-5948

**Contact:** Irene Castellón <[icastellon@ub.edu](mailto:icastellon@ub.edu)>

## Dependency Grammar for English

**Authors:** Jordi Carrera, Marina Lloberas, Nevena Tincova, Irene Castellón

**References:** Grup de Recerca Interuniversitari d'Aplicacions Lingüístiques (in collaboration with TALP – UPC): <http://grial.uab.es>

**Description:** Dependency rules for the English grammar amount to circa 1606. Rules have been provided for all major kinds of clauses: declaratives, imperatives, interrogatives, completives, relatives, adverbial and existential. Analogously, separate verb phrase rules have been provided for intransitive, transitive and ditransitive sentences, including specific sets of rules for dealing with completive sentences.

**Functionality:** Dependency parsing of English

Technology: The grammar is included in Freeling (<http://www.lsi.upc.edu/~nlp/freeling/>)

**Technical Requirements:** It has to be downloaded with Freeling.

**Modules:** -

**Innovation:** Wide-coverage deep parsing grammar for English

**Development:** This grammar has been developed in the KNOW project . Ministerio de Educación y Ciencia (TIN2006-1549-C03-02)

**Publications:**

J.Carrera, I. Castellón, M.Lloberes, L.I.Padró, N. Tincova (2008). "Dependency Grammars in Freeling", *Procesamiento del Lenguaje Natural*, 2008:41, p. 13-20. ISSN: 1135-5948

**Contact:** Irene Castellón <[icastellon@ub.edu](mailto:icastellon@ub.edu)>

## Dependency Grammar for Spanish

**Authors:** Jordi Carrera, Marina Lloberas, Nevena Tincova, Irene Castellón

**References:** Grup de Recerca Interuniversitari d'Aplicacions Lingüístiques (in collaboration with TALP – UPC): <http://grial.uab.es>

**Description:** Spanish dependency grammar consists of a set of 4349 rules, of which 3777 complete the parse tree by creating dependencies and the remaining 572 label these dependencies. These rules act on a number of categories, such as noun, verb and prepositional phrases, pronouns, coordination, passive voice, punctuation and subordination.

**Functionality:** Dependency parsing of Spanish

Technology: The grammar is included in Freeling (<http://www.lsi.upc.edu/~nlp/freeling/>)

**Technical Requirements:** It has to be downloaded with Freeling.

**Modules:** -

**Innovation:** Wide-coverage deep parsing grammar for Spanish

**Development:** This grammar has been developed in the KNOW project . Ministerio de Educación y Ciencia (TIN2006-1549-C03-02)

**Publications:**

J.Carrera, I. Castellón, M.Lloberes, Ll.Padró, N. Tincova (2008). "Dependency Grammars in Freeling", *Procesamiento del Lenguaje Natural*, 2008:41, p. 13-20. ISSN: 1135-5948

**Contact:** Irene Castellón <[icastellon@ub.edu](mailto:icastellon@ub.edu)>

## SRG: Spanish Resource Grammar

**Authors:** Montserrat Marimon Felipe, GRIAL, Universitat de Barcelona.

**References:** <http://grial.uab.es/srg>

**Description:** open-source, multi-purpose, large-coverage HPSG grammar for Spanish.

**Functionality:** The SRG records analyses in three different formats: 1) a derivation tree composed of identifiers of lexical items and constructions used to construct the analysis, 2) a traditional phrase structure tree labeled with atomic labels. e.g. S, NP, VP, etc., and 3) a Minimal Recursion Semantic Representation meaning representation which subsumes the tectogrammatical (functor-argument) structure.

**Technology:** The SRG is implemented within the Linguistic Knowledge Builder (LKB) system (<http://wiki.delph-in.net/moin/LkbTop>).

**Technical Requirements:** The LKB system runs in linux and windows.

**Modules:** The SRG includes: 1) about 200 phrase structure rules and 50 lexical rules, and 2) a lexicon of about 50,000 entries.

**Innovation:** The SRG is open-source, multi-purpose, large-coverage and precise (HPSG-based).

**Development:** The development of the SRG was funded by the Juan de la Cierva program (MEC, Spain) within the TEXTERM-2 project (BFF2003-2111) at the IULA of the UPF. The Current research, which is funded by the Ramon y Cajal program (MICINN, Spain), takes place in the following areas: 1) treebanking , 2) disambiguation , and 3) evaluation .

**Publications:**

Montserrat Marimon, Núria Bel, Sergio Espeja and Natalia Seghezzi. The Spanish Resource Grammar: pre-processing strategy and lexical acquisition, in T. Baldwin et al. (eds.) *Proceedings of the Workshop on Deep Linguistic Processing, Association for Computational Linguistics (ACL-DLP-2007)*.

Montserrat Marimon, Núria Bel and Natalia Seghezzi. Test Suite Construction for a Spanish Grammar, in Tracy Holloway King and Emily M. Bender (eds.) *Proceedings of the Grammar Engineering Across Frameworks (GEAF-2007) Workshop "CSLI Studies in Computational Linguistics ONLINE"*, pp. 250-264. ISSN 1557-5772.

Montserrat Marimon, Natalia Seghezzi and Núria Bel. An Open-source Lexicon for Spanish, *Procesamiento del Lenguaje Natural*, n. 39, pp. 131-137. Septiembre, 2007. ISSN 1135-5948.

**Contact:** Montserrat Marimon <[montserrat.marimon@gmail.com](mailto:montserrat.marimon@gmail.com)>

## CIAOSENSO

**Authors:** Davide Buscaldi (Ph.D. student) and Paolo Rosso

**References:** <http://www.dsic.upv.es/grupos/nle/resources/cdd-2.0.1.tar.gz>

**Description:** This is a Word Sense Disambiguation (WSD) tool based on Conceptual Density.

**Functionality:** This tool can be used to disambiguate English text.

**Technology:** It has been written in C++.

**Technical Requirements:** any Linux, GCC4.0, WordNet.

**Modules:** -

**Innovation:** This tool participated to Senseval-3 and Semeval, obtaining good results among the unsupervised systems.

**Development:** Developed as part of the CIAOSENSO MCYT HI 2002-0140 research project.

**Publications:**

Paolo Rosso, Francesco Masulli, Davide Buscaldi, Ferran Pla and Antonio Molina, Automatic Noun Sense Disambiguation., in: *Computational Linguistics and Intelligent Text Processing*, 4th International Conference, LNCS 2588, pages 273-276, Springer, 2003.

Paolo Rosso, Francesco Masulli and Davide Buscaldi, Word Sense Disambiguation using Conceptual Distance, Frequency and Gloss, in: *Int. Conf. on Natural Language Processing and Engineering Knowledge*, pages 120-125, IEEE, Beijing, China, 2003.

Davide Buscaldi, Paolo Rosso and Francesco Masulli, The upv-unige-CIAOSENSO WSD System, in: *Senseval-3 workshop, ACL 2004*, pages 77-82, 2004.

**Contact:** Davide Buscaldi <[dbuscaldi@dsic.upv.es](mailto:dbuscaldi@dsic.upv.es)>

## SVM Model for Arabic NER

**Authors:** Yassine Benajiba (Ph.D. student) and Paolo Rosso

**References:** <http://www.dsic.upv.es/grupos/nle/>

**Description:** A Named Entity Recognition model which is trained using an SVM-based approach over a 125,000 Arabic tokens training file.

**Functionality:** The model allows the user to extract the named entities with an open-domain text and classify them into 4 different categories, namely: person, location, organization and miscellaneous. In order to enhance the performance, the model was trained over ATB segmented data which helps to decrease the sparseness in Arabic data.

**Technology:** The model is trained using Support Vector Machines approach with the Yamcha Toolkit (<http://chasen.org/~taku/software/yamcha/>).

**Technical Requirements:** The input file should be ATB segmented and transliterated to Romanized characters. Also it requires Yamcha to be installed in the machine.

**Modules:** One module which consists of basic decoding on the data provided by the user.

**Innovation:** To our knowledge, no Arabic NER systems are freely available for the research community. The model has been tested and the results have been presented at EMNLP and ACIT conferences.

**Development:** Developed as part of Yassine Benajiba's AECI Ph.D. and the MiDES CICYT TIN2006-15265-C06-04 research project, co-funded by the AECI-PCI A01031707 project.

### Publications:

Benajiba Y., Diab M., Rosso P. Arabic Named Entity Recognition using Optimized Feature Sets. In: Proc. Int. Conf. on Empirical Methods in Natural Language Processing, EMNLP-2008, Waikiki, Honolulu, U.S.A., October, 2008

Benajiba Y., Diab M. Rosso P. Arabic Named Entity Recognition: An SVM-based approach. In: Proc. Int. Arab Conf. on Information Technology, ACIT-2008, Hammamet, Tunisia, December, 2008

**Contact:** Yassine Benajiba <[benajibayassine@gmail.com](mailto:benajibayassine@gmail.com)>

## WaCOS: Watermarking Corpora Online System

**Authors:** David Pinto

**References:** <http://www.dsic.upv.es/grupos/nle/>, <http://nlp.dsic.upv.es:8080/watermarker>,

<http://nlp.cs.buap.mx/watermarker>

**Description:** The Watermarking Corpora On-line System (WaCOS) is made up of a set of measures for the assessment of text corpora.

**Functionality:** WaCOS allows linguistics and computational linguistics researchers to study the following corpus features: *domain broadness*, *shortness*, *class imbalance*, *stylometry* and *structure*. WaCOS provides a friendly interface in order to easily evaluate corpora.

**Technology:** WaCOS front-end has been programmed with PHP. It integrates a set of modules written in different programming languages (C, C++, Java, AWK). Among the several components of this system, it uses n-gram language modelling, Zipf distribution of frequencies, density-based measures, internal clustering validity measures, etc in order to assess the relative hardness of a given corpus.

**Technical Requirements:** The end user is only required of an Internet browser in order to access the on-line system.

**Innovation:** A freely available web-based tool which may be used to study peculiarities of textual corpus features.

**Development:** Developed as part of David Pinto's Ph.D. and the MiDES CICYT TIN2006-15265-C06-04 research project.

#### **Publications:**

David Pinto: On Clustering of Narrow Domain Short-Text Corpora. PhD Thesis, Universidad Politécnica de Valencia, Spain, July 2008.

Diego Ingaramo, David Pinto, Paolo Rosso, Marcelo Errecalde: Evaluation of Internal Validity Measures in Short-Text Corpora. CICLing 2008. Lecture Notes in Computer Science 4919, Springer-Verlag: 555-567, 2008

Rafael Guzman, Manuel Montes, Paolo Rosso, Luis Villaseñor-Pineda and David Pinto: Semi-supervised Approach for WSD using the Web as Corpus. CICLing 2009. Lecture Notes in Computer Science, Springer-Verlag, 2009

**Contact:** David Eduardo Pinto Avendaño <[dpinto@cs.buap.mx](mailto:dpinto@cs.buap.mx)>

## **SemRol**

**Authors:** Paloma Moreda y Manuel Palomar

**References:** GPLSI, Departamento de Lenguajes y Sistemas Informáticos, Universidad de Alicante: <http://gplsi.dlsi.ua.es/mwgpplsi/index.php/Portada>

**Description:** Herramienta basada en corpus para la anotación con roles semánticos de los constituyentes de una oración respecto al verbo. Conjunto de roles: PropBank. Corpus entrenamiento: PropBank.

**Functionality:** La anotación requiere como entrada un fichero en inglés en lenguaje natural con cada oración que se desee anotar en una línea diferente. Como resultado del proceso se devuelve la anotación de roles en formato Start\*End, además de la información proporcionada por otras herramientas utilizadas en el proceso de análisis: morfológico, sintáctico y entidades nombradas.

**Technology:** Herramienta desarrollada en C y ejecutable desde línea de comandos.

**Technical Requirements:** Requiere un analizador morfológico (Freeling), sintáctico (D. Roth), reconocedor de entidades (LinPipe) y algoritmos de aprendizaje TiMBL y Máxima entropía.

**Modules:** Arquitectura estructurada en torno a dos grandes módulos: i) módulo de procesamiento offline: lleva a cabo el proceso de ajuste y selección de la información necesaria para el proceso de anotación; ii) módulo de procesamiento online: realiza la propuesta de anotación.

**Innovation:** A diferencia de otras herramientas de anotación de roles semánticos, SemRol puede afrontar la

anotación desde diferentes perspectivas dependiendo de lo que se desee anotar. Así, es posible llevar a cabo una anotación por sentidos, más adecuada para argumentos numerados; una anotación única, adecuada para adjuntos; una anotación específica para tipos de roles concretos, en el caso de querer anotar sólo lugar, tiempo, etc.; o bien una anotación completa.

**Development:** La herramienta forma parte de los trabajos realizados dentro de la Tesis doctoral de Paloma Moreda y de los trabajos desarrollados en el proyecto TEST-MESS (TIN2006-15265- C06-01).

#### **Publications:**

Moreda Pozo, P. Los roles semánticos en la tecnología del lenguaje humano: Anotación y Aplicación. Tesis Doctoral. Director: Dr. Manuel Palomar. Julio, 2008.

Moreda, P., Llorens, H., Saquete E., Palomar M. The influence of Semantic Roles in QA: A comparative analysis. Sociedad Española para el Procesamiento del Lenguaje Natural (SEPLN), num. 41, pp. 5562, ISSN 11355948, 2008, Spain.

**Contact:** Paloma Moreda <[paloma@dlsi.ua.es](mailto:paloma@dlsi.ua.es)>

## **SUPAR**

**Authors:** Antonio Ferrández Rodríguez.

**References:** GPLSI, Departamento de Lenguajes y Sistemas Informáticos, Universidad de Alicante: <http://gplsi.dlsi.ua.es/mwgpplsi/index.php/Portada>

**Description:** Es un Sistema de Procesamiento de Lenguaje Natural orientado al análisis sintáctico (completo o parcial) y a la resolución de la anáfora. Éste sistema puede incorporar cualquier etiquetador léxico (POS tagger).

**Functionality:** El sistema funciona tanto para el español como para el inglés. Para realizar un análisis morfosintáctico, recibe como entrada un fichero de texto en lenguaje natural y el idioma. Como salida se almacena en el fichero de salida el texto analizado morfosintácticamente y con resolución de anáfora pronominal, la cual se etiqueta.

**Technology:** Sistema desarrollado en Prolog con versiones ejecutables tanto en Windows como en Linux. Dispone de un interfaz gráfico para su funcionamiento interactivo con el usuario, y también se ha desarrollado una versión ejecutable desde la línea de comando.

**Technical Requirements:** esta herramienta hace uso del postagger Maco para el español y del Tree Tagger para el inglés.

**Modules:** Necesita de un POS tagger que etiquete léxicamente el texto.

**Innovation:** Amplia cobertura sintáctica para el español e inglés, permitiendo un análisis sintáctico equivalente entre varios idiomas (bloques sintácticos similares: SN, SP, Aposiciones, Núcleos Verbales, etc.). Rapidez de ejecución que permite su uso en grandes corpus, como los empleados en las competiciones de RI y QA del CLEF y TREC.

**Development:** Fue resultado de la Tesis Doctoral de Antonio Ferrández Rodríguez, y el cual evolucionó durante las competiciones CLEF y TREC.



**Publications:**

Antonio Ferrández Rodríguez, Manuel Palomar, Lidia Moreno: An Empirical Approach to Spanish Anaphora Resolution. Machine Translation 14(34): 191216 (1999)

Antonio Ferrández, Manuel Palomar, Lidia Moreno: Anaphor Resolution in Unrestricted Texts with Partial Parsing. COLINGACL 1998: 385391

**Contact:** Antonio Ferrández Rodríguez <[antonio@dlsi.ua.es](mailto:antonio@dlsi.ua.es)>

**WSD-UA**

**Authors:** Andrés Montoyo y Manuel Palomar

**References:** GPLSI, Departamento de Lenguajes y Sistemas Informáticos, Universidad de Alicante: <http://gplsi.dlsi.ua.es/mwgpplsi/index.php/Portada>

Demo disponible en: <http://www.dlsi.ua.es/projectes/srim/desambiguacion.html>

**Description:** Esta aplicación utiliza el método de marcas de especificidad para el tratamiento de la desambiguación de textos. Asigna sentidos a las palabras según el diccionario electrónico EuroWordNet, tanto en español como en inglés.

**Functionality:** Esta herramienta funciona tanto para el español como para el inglés. Como entrada, el sistema recibe el fichero a procesar, el fichero dónde se guardará la salida, el idioma y el sufijo.

**Technical Requirements:** -

**Innovation:** -

**Development:** Esta herramienta fue desarrollada dentro del proyecto PROFIT “Construcción de un sistema de recuperación de información multilingüe en la web” (FIT-150500-2002-416), subvencionado por el antiguo Ministerio de Ciencia y Tecnología. Fue creada en la Universidad de Alicante por Andrés Montoyo con la colaboración de May Calle y Sonia Vázquez.

**Publications:**

Andrés Montoyo y Manuel Palomar. Word Sense Disambiguation with Specification Marks in Unrestricted Texts. Páginas 103–107 de: DEXA Workshop. IEEE Computer Society. 2002.

Andrés Montoyo, Armando Suárez, Manuel Palomar: Combining Supervised-Unsupervised Methods for Word Sense Disambiguation. CICLing 2002: 156-164

**Contact:** Andrés Montoyo: [montoyo@dlsi.ua.es](mailto:montoyo@dlsi.ua.es)

**HMM PoS ACOPOST**

**Authors:** Sergio Ferrández y Jesús Peral.

**References:** GPLSI, Departamento de Lenguajes y Sistemas Informáticos, Universidad de Alicante: <http://gplsi.dlsi.ua.es/mwgpplsi/index.php/Portada>

**Description:** PoS Tagger que está basado en el algoritmo de HMM implementado en la herramienta ACOPOST. Está entrenado para el español con el corpus CLIP-TALP.

**Functionality:** Esta herramienta, que funciona para el español, requiere como entrada un fichero de texto en lenguaje natural y el fichero de salida. El fichero de salida quedará anotado con las etiquetas PoS correspondientes.

**Technology:** -

**Technical Requirements:** -

**Modules:** -

**Innovation:** -

**Development:** -

**Publications:**

Sergio Ferrández, Jesús Peral: Investigating the Best Configuration of HMM Spanish PoS Tagger when Minimum Amount of Training Data Is Available. NLDB 2005: 341-344

**Contact:** Sergio Ferrández <[sferrandez@dlsi.ua.es](mailto:sferrandez@dlsi.ua.es)>

## NERUA

**Authors:** Oscar Ferrandez, Zornitsa Kozareva, Andres Montoyo y Rafael Muñoz

**References:** GPLSI, Departamento de Lenguajes y Sistemas Informáticos, Universidad de Alicante: <http://gplsi.dlsi.ua.es/mwgpplsi/index.php/Portada>

**Description:** NERUA es un sistema de reconocimiento de entidades para el español. Realiza el etiquetado de las entidades en cuatro categorías: PERSONA, LOCALIZACION, ORGANIZACION y MISCELÁNEA (aquellas que no corresponden a ninguna de las categorías anteriores). Para el reconocimiento y la clasificación, NERUA emplea tres algoritmos de aprendizaje automático: Hidden Markov Model, Máxima Entropía y Memory-based learner. Para su aprendizaje y evaluación se utilizaron los recursos proporcionados por la conferencia CoNLL-2002. Además, NERUA tiene la opción de utilizar una combinación de los clasificadores mediante una estrategia de votación simple.

**Functionality:** Etiquetado de entidades nombradas del tipo PERS PERSONA, LOCALIZACION, ORGANIZACION y MISCELÁNEA (aquellas que no corresponden a ninguna de las categorías anteriores) en texto plano.

**Technology:** Herramienta desarrollada en el lenguaje de programación C++.

**Technical Requirements:** Este reconocedor de entidades utiliza los siguientes recursos externos: ACOPST (<http://acopost.sourceforge.net>), TIMBL (<http://ilk.uvt.nl/timbl>) y MaxEnt, desarrollada por Armando Suárez <[armando@dlsi.ua.es](mailto:armando@dlsi.ua.es)>, miembro del GPLSI.

**Modules:** Consta de dos módulos: uno para la detección y otro para la clasificación de entidades.  
**Development:** El desarrollo de la herramienta fue parcialmente financiada bajo los proyectos de investigación nacionales CICyT número TIC2003-07158-C04-01 y PROFIT número FIT-340100-2004-14 y por la Generalitat Valenciana bajo los proyectos GV04B-276 y GV04B-268.

**Publications:**

Kozareva, Z; Ferrández O.; Montoyo, A.; Muñoz R.; Suarez A.; Gómez J.; Combining Data-driven systems for improving Named Entity Recognition Año: 2007 Volumen: 61 Número: 3 Páginas: 449-466 Publicación Data & Knowledge Engineering

Ferrández, O.; Kazareva, Z.;Montoyo, A.; Muñoz, R ; NERUA: sistema de detección y clasificación de entidades utilizando aprendizaje automático Año: 2005 Número: 35 Revista:1135-5948. Procesamiento del Lenguaje Natural

**Contact:** Oscar Ferrández <[ofe@dlsi.ua.es](mailto:ofe@dlsi.ua.es)>

## 3. Sistemas para tareas específicas

### 3.1 Asistentes y Sistemas de Diálogo

#### Asistente Virtual Semántico

**Autores:** Juan Llorens, Jose Antonio Moreiro, Jose Miguel Fuentes, Jorge Morato Lara, Sonia Sánchez Cuadrado, Anabel Fraga, Valentín Moreno, George Andreadakis, Vicente Palacios, Mónica Marrero, Karina Robles

**Referencias:** [http://www.asistentevirtual.es/Asistente\\_Virtual\\_Semantico.html](http://www.asistentevirtual.es/Asistente_Virtual_Semantico.html)

**Descripción:** Se ha desarrollado un asistente virtual basado en semántica y procesamiento del lenguaje natural para proporcionar atención de un sitio Web. Sus principales características son el uso del contexto, anticipación de consultas frecuentes y solución a consultas fuera del dominio de interrogación.

**Funcionalidad:** El asistente virtual desarrollado, es un agente conversacional representado por un avatar configurable, que puede adaptarse a diferentes áreas temáticas. Existen tres tipos de consultas a las que puede responder: cultura general, preguntas temáticas de respuesta estructurada, preguntas temáticas de respuesta textual. Además es capaz de utilizar el contexto de preguntas previas y analizar documentos para identificar posibles respuestas.

**Tecnología:** se ha desarrollado en la plataforma DotNet, utilizando como gestor de bases de datos SQL Server.

**Requisitos técnicos:** 2GB de memoria; 100 MB en disco; windows server, IIS y SQLServer

**Módulos:** servicio AVS (Asistente virtual semántico), AVS web service, audio server, cliente (Windows u otros)

**Innovación:** Mecanismos para su adaptación a intranets: 1) Uso de ontologías para expansión de las consultas ; 2) Uso de datos localizados en bases de datos relacionales como respuestas a preguntas , y 3) Uso de listados de preguntas-respuesta (FAQ's)

**Development:** desarrollo propio

#### Publicaciones:

Sonia Sánchez-Cuadrado, Jorge Morato, Vicente Palacios-Madrid, Juan Llorens-Morillo y José Antonio Moreiro-González. De repente, ¿todos hablamos de ontologías? El profesional de la Información, Noviembre-diciembre 2007, vol. 16, núm. 6 .

Sánchez Cuadrado, Sonia; Morato, Jorge; Moreiro, José Antonio; Marrero, Mónica. Definición de una metodología para la construcción de sistemas de organización del conocimiento a partir de un corpus documental en lenguaje natural. Revista de la SEPLN, 39 septiembre 2007, p. 213-220. XXIII Congreso de la Sociedad Española para el Procesamiento del Lenguaje Natural. Universidad de Sevilla 10, 11, 12 de septiembre de 2007

## Flexible Dialogue System

**Authors:** Marta Gatus, Meritxell González.

**References:** <http://www.lsi.upc.es/~nlp/disi>

**Description:** This is a mixed-initiative Dialogue System designed to guide the user when accessing the web. It has been designed to access different types of web services and information. The main goal in the system design have been its adaptability to the different types of web contents and different types of users and different languages. The Dialogue System consists of four main modules: the Natural Language Analyzer, the Dialogue Manager, the Language Generator and the Services' Access. The Dialogue System is focused in the development of a platform for accessing Web Services. The communication channel can be either textual or by voice, using natural language. The aim of our Dialogue System is to facilitate the integration of new applications into the platform. Then, the development of application specific resources should be easy and able to do by non skilled.

**Functionality:** Textual or spontaneous speech access to Web services (currently, Spanish on-line access to cultural agenda and large objects collection services).

**Technology:** The Dialogue System is developed in J2EE, nevertheless some modules additionally uses other technologies. The Natural Language Analyzer has been developed in Prolog, more suitable for this task. All the resources are written in XML files. Some of them use standards, such as VoiceXML, SRGSXML and OWL. Standards are used when possible. Additionally, we have developed specific XML Schemas for writing the rest of the resources, for example the communication between the Prolog subsystem and the Natural Language Analyzer module, the linguistic resources for the Language Generator, and the Dialogue Plans.

**Technical Requirements:** Basic System: The basic Dialogue System uses Textual Web Chat Client, running on Tomcat Server. The rest of the System runs JVM plus Swi-Prolog Server. More specific technical requirements depends on the Application integrated in the System. Our current Services are also Java Applications using XML files containing the database.

Voice-added System: The Voice subsystem is telephone based, and needs specific hardware and software. The HOPS System uses Loquendo(TM) VoiceXML platform plus a telephone card. Our current system doesn't allow voice access to the platform, nevertheless the linguistic resources are developed taking into account both channels.

**Modules:** For dialogue management we developed an independent module, the Dialogue Manager (DM). It enables mixed-initiative conversations and it is mode, language and domain independent. It follows the issue-based dialogue management model described in (Larsson, 2002), which describes dialogues in terms of issues that are raised and that have to be solved. The Dialogue Manager uses plans for guiding the conversation through the Operations of the Service. We have developed general recipes for creating plans and resources for new applications. Those recipes are classified into three types: SEARCH, QUERY and TRANSACTION.

The Dialogue System incorporates a Natural Language Generator (NLG) component to generate the system's messages. In order to obtain the most appropriate system prompts for a specific service, the generator component uses a syntactic-semantic taxonomy which relates the specific domain concepts to the linguistic structures needed for their expression. The system messages are not generated at run-time but when adapting the DS to a new web service. Several of the messages generated contain variables that would be instantiated at run-time, considering the dialogue context. When the DS is adapted to a new service, the service task parameters have to be classified according to the syntactic-semantic taxonomy and linked to the corresponding lexical entries. Then, the system prompts are generated automatically. However, the resulting sentences can be supervised and selected manually. At run-time the NLG would complete these messages considering dialogue context. Additionally, when system intervention includes several communication acts,

the messages expressing this acts are combined dynamically (following a fixed order): greet moves first, then confirmation moves, then answer moves, then asking moves, and finally quit moves.

Textual inputs are processed by a left-corner parser performing syntactic and semantic analysis in parallel has been adapted for a practical dialogue system for multiple applications. The parser uses domain-restricted grammars and lexicons obtained from ontologies representing application specific knowledge. It also uses the knowledge of the dialogue context to select the grammar rules related to the dialogue focus.

The current working System uses XML based data sources for the simulating the Services Access. The ongoing work includes the use of OWL and RDFS for enabling the online access to Web Services as well as the Standarization of the resources.

An ontology-based representation is used for sharing data among modules, as well as for specific modules resources. This representation facilitates the integration of new applications into the system.

**Innovation:** One of the main goals of this project has been the improvement of existing commercial Dialogue Systems by combining practical results from various research areas: Speech, Natural Language, Dialogue Management and Ontologies.

Most recent works on spoken DSs in the commercial area are based on exploiting the VoiceXML language. But, it also presents several limitations, for example, it presents some dialogue management drawbacks, as the limited support to the user-initiative interactions.

Our work has been focused on the study of how Dialogue Systems, and in particular VoiceXML platforms, could be improved by using language, dialogue and ontology techniques. We also have work on techniques for adapting the interaction to the user expertise. We studied how it improves the communication process. Finally, we are currently working on improved plans and recipes representation. The aim of our current direction is to enable more sophisticated dialogue management, without losing the simplicity in the specific application resources.

**Development:** The Dialogue System was developed in the context of the HOPS project (IST-2002-507967).

#### **Publications:**

Meritxell González. Dialogue Management for Multilingual communication through different channels. DEA and PT, LSI Department, UPC. Barcelona, July 2007

Marta Gatus and Meritxell González. Discourse Management in Voice Systems for Accessing Web Services. Workshop on the Semantics and Pragmatics of Dialogue. DECALOG 2007. Rovereto, May 2007.

Marta Gatus, Meritxell González and Elisabet Comelles. An Information State-Based Dialogue Manager for Making Voice Web Smarter. 16th International Worl Wide Web Conference. WWW2007. Banff, May 2007.

Marta Gatus, Meritxell González, Eli Comelles and Leonardo Lesmo. Natural Language Processing and Dialogue Management Development. European Project HOPS (IST-2002-507967). Deliverable D4.3. April 2007.

Marta Gatus and Meritxell González. A multilingual Dialogue System for Accessing the WEB. 3rd International Conference on Web Information Systems and Technologies. WEBIST 2007. Barcelona, March 2007.

Pablo Hernández, Jordi Sánchez, Ángel López, Sheyla Militello, Marta Gatus, Meritxell González, Eli Comelles, Leonardo Lesmo, Xavier Noria, Robert Salla, Carlos de la Morena, Jose Antonio Fernández, Alberto Deiro. HOPS Architecture Specifications. European Project HOPS (IST-2002-507967). Deliverable D4.1. May 2006.

Marta Gatus and Meritxell González. Integrating Semantic Web and Language Technologies to Improve the Online Public Administrations Services. 15th International World Wide Web Conference. WWW2006. May 23-26, 2006, Edinburgh, Scotland. ACM 1-59593-323-9/06/0005.

Marta Gatus and Meritxell González. Using Application-Specific Ontologies to Improve Performance in a Bottom-up Parser. Workshop Knowledge and Reasoning for Language Processing, KRAQ'06 . 11th Conference of the European Chapter of the Association for the Computational Linguistics. EACL'06. Trento, Italy, April 2006. Association for the Computational Linguistics, ISBN, 1-932432-59-0, pp. 12-19.

Marta Gatus and Meritxell González. Obtaining Linguistic Resources for Dialogue Systems from Application Specifications and Domain Ontologies. 10th International Conference on Speech and Computer, SPECOM 2005. University of Patras, October 2005

Meritxell González, Marta Gatus. Un sistema de diálogo multicanal para acceder a la información y servicios de las administraciones públicas. XXI Congreso de la SEPLN, I Congreso Español de Informática, CEDI. Granada , Septiembre 2005

Marta Gatus, Meritxell González. The project HOPS: Enabling an Intelligent Natural Language Based Hub for the Deployment of Advanced Semantically Enriched Multi-channel Mass-scale Online Public Services. XXI Congreso de la SEPLN, I Congreso Español de Informática. Granada , Septiembre 2005

Marta Gatus, Meritxell González. Un sistema de diálogo multilingüe dirigido por la semántica. Revista de la SEPLN, Vol.34. Junio 2005.

Marta Gatus, Meritxell González, Leonardo Lesmo, Pietro Torasso. Natural Language Processing Technologies. European Project HOPS (IST-2002-507967). Deliverable D3.2. February 2005.

Marta Gatus, Meritxell González. Using Ontologies for Improving the Communication Process in a Dialogue System. Proceedings of the Sixth International Workshop on Computational Semantics, IWCS-6. Tilburg, 2005

Marta Gatus, Meritxell González. Utilización de ontologías en el desarrollo de sistemas de diálogo. III Jornadas en Tecnología del Habla. Valencia, Noviembre 2004

Marta Gatus, Meritxell González. Ontology-driven VoiceXML Dialogues Generation. Berliner XML-Tage 2004. Humboldt University Berlin, October 2004

**Contact:** Marta Gatus <[gatus@lsi.upc.edu](mailto:gatus@lsi.upc.edu)>, Meritxell González <[mgonzalez@lsi.upc.edu](mailto:mgonzalez@lsi.upc.edu)>

## **INTERACTOR (Natural Interaction Platform)**

**Authors:** Paloma Martínez, head of the Advanced Databases Laboratory (Labda). F. Javier Calle, Dolores Cuadra, Senior Researchers. David del Valle, Jessica Rivero, Junior Researchers.

**References:** Advanced Databases Group (Labda): <http://basesdatos.uc3m.es/index.php?id=202&L=0>

**Description:** *Interactor* is an interaction platform based on Natural Interaction (human-like) techniques. It enables to implement a corpus-based Task Oriented Interaction Domain with little effort, and thus it assumes an application and provides access to it through Natural Interaction.

**Functionality:** Once implanted onto a set of tasks, Interactor receives user interventions (represented through semantic structures) and handles the interaction in a human-like way. When required, it invokes the execution of some task(s), which are applications or drivers accessible from the server, and feeds the

interaction back with its (their) results. Finally, it constructs system's interventions (represented through semantic structures) and provides them. Besides, its Situation Model gathers knowledge on spatio-temporal features and objects within the interaction domain, and it is able to receive and process information about the user's situation.

**Technology:** Interactor dialogue management is composed of four agents implemented in Java, running in Ecosystem, which provide basic services of agency registration, agent communication, and brokering, among others. The situation component is implemented through two agents (also in Java) and based on a spatio-temporal database. The rest of the Interactor system (other agents) is also implemented in Java. All the mentioned databases are set on the Oracle<sup>TM</sup> 11g DBMS.

**Technical Requirements:** Interactor is currently running on a Sun Fire X4500 server, which also has the DBMS server, under Windows XP. However, due to the flexibility of the system architecture, the DBMS can be set on another server (also with different OS), and even each individual agent might run in different computers (with access to the DBMS server). Thus, system efficiency can be boosted as required.

**Modules:** For interaction performance, the following modules are required (1) Ecosystem, (2) Interactor components, (3) Dialogue management agents, and (4) Situation agents. For new interaction domains implementation are also required (5) the Cognos toolkit (for analysing and implementing interaction corpus), and (6) the Tracer (tool for monitoring the interaction processes).

**Innovation:** Very few interaction systems count on a Situation Model (few prototypes, none commercial). This enriches interactive reasoning with the circumstantial aspect, apart from the situational services it can provide. In addition, this Situation Model is empowered by spatio-temporal database technology, ensuring versatility, scalability and efficiency.

**Development:** Interactor and the Threads Model were the result of a PhD dissertation in 2005, and developed from the experience gained in several funded European and National research projects.

#### **Publications:**

Calle, J., Martínez, P., Valle, D., Cuadra, D. *Towards the Achievement of Natural Interaction*. Engineering the User Interface: from Research to Practice. © 2009 Springer (ISBN: 978-1-84800-135-0).

Calle, J., García-Serrano, A., Martínez, P. *Intentional Processing as a Key for Rational Behaviour through Natural Interaction*. Interacting With Computers (ISSN: 0953-5438), Vol. 18/6, 1419—1446. © 2006 Elsevier.

Cuadra, D., Calle, F.J., Rivero, J., Valle, D. *Applying Spatio-Temporal Databases to Interaction Agents*. International Symposium on Distributed Computing and Artificial Intelligence 2008 (DCAI'08). Volume: 50. Pag: 536-540. © 2009 Springer Berlin / Heidelberg (1615-3871).

Contact: F. J. Calle <[fcalle@inf.uc3m.es](mailto:fcalle@inf.uc3m.es)>



## 3.2 Buscadores

### FlickrBabel

**Authors:** Francisco Carrero, José Carlos Cortizo, Borja Monsalve (Wipley, Social Gaming Platform)

**References:** English version: <http://www.flickrbabel.com/en>,

Spanish version: <http://www.flickrbabel.com/es/>

**Description:** Sometimes, when you're searching through Flickr, it's better to search in multiple languages in order to get more results. Since Flickr is a site whose popularity has spread throughout the world, millions of users upload picture titles and tags in their native tongue. This site will allow you to insert a search query for Flickr, and it will search for you in multiple languages. This greatly broadens the scope of results you'll get. For instance, search for the word "car", and the site will search for it in many different languages, allowing you to see pictures of a car someone from Turkey might have uploaded, which you might otherwise not have been able to find. A simpler way to look at it is as a mash-up of Flickr search and Google's translation services.

**Functionality:** FlickrBabel is a images search engine that retrieves images from Flickr that matches the user's query. FlickrBabel first expands the query by adding the translation of the query to 5 languages (English, Spanish, German, French and Portuguese) and then sends the expanded query to Flickr and shows the images retrieved. FlickrBabel also shows a map for the geolocalized images and allows the users to restrict the results to a given location (city, area, country, etc.)

**Technology:** FlickrBabel is developed in PHP and makes use of Google Translation and Flickr APIs.

**Technical Requirements:** The system's needs are a Web Server with PHP support, constant Internet access and a developer's key to Flickr API.

**Modules:** There are 4 main modules: 1) query pre-processing and expansion, 2) search process, 3) visualization and 4) geolocation restrictions.

**Innovation:** There are some R&D projects related to multilingual multimedia retrieval but there are no user-friendly tools that implements the techniques related to those projects. FlickrBabel is a simple but user oriented solution.

**Development:** FlickrBabel is the first product of Social Gaming Platform, first created as a experiment to test Google Translation and Flickr APIs, but finally implemented as a mainstream Internet application.

**Publications:** There are no scientific references that directly explains FlickrBabel, but part of the work behind FlickrBabel has been applied in:

**Carrero, F., Cortizo Pérez, J. C., Gómez Hidalgo, J. M.,** Testing Concept Indexing in Crosslingual Medical Text Classification. Proceedings of the IEEE ICDIM 2008

**Contact:** José Carlos Cortizo Pérez <[josecarlos.cortizo@wipley.com](mailto:josecarlos.cortizo@wipley.com)>

## Arabic JIRS

**Authors:** Yassine Benajiba (Ph.D. student), José Manuel Gomez (Universidad Alicante) and Paolo Rosso

**References:** <http://www.dsic.upv.es/grupos/nle/>

**Description:** Arabic JIRS is an adaptation of the JIRS system to the Arabic language. It is a passage retrieval system for Arabic texts which return a set of relevant passages to the user's query (which is written in Arabic).

**Functionality:** The Arabic JIRS, indexes Arabic documents and then provides an interface in order to extract passages which are relevant to the user's query.

**Technology:** JIRS is fully built on JAVA and adopts a server/client framework. It uses n-gram language modelling for indexation and an a distance density based approach to rank the retrieved passages from the most to the least relevant.

**Technical Requirements:** The machine should be able to run JAVA programs.

**Modules:** A server module which indexes the document and a client module to send the query.

**Innovation:** To our knowledge, no Arabic PR systems are freely available for the research community.

**Development:** Developed as part of Yassine Benajiba's AECI Ph.D. and the MiDES CICYT TIN2006-15265-C06-04 research project, co-funded by the A706706 project.

### Publications:

Benajiba Y., Rosso P., Gómez J.M. Adapting JIRS Passage Retrieval System to the Arabic. In: Proc. 8th Int. Conf. on Comput. Linguistics and Intelligent Text Processing, CICLing-2007, Springer-Verlag, LNCS(4394), pp. 530-541, 2007

**Contact:** Yassine Benajiba <[benajibayassine@gmail.com](mailto:benajibayassine@gmail.com)>

## JBrainDead

**Authors:** Juan M. Cigarrán, researcher, and Julio Gonzalo, head of the NLP Group at UNED.

**References:** Demo available: <http://bender.lsi.uned.es:8080/ModuloWeb/jbraindead.html> , NLP Group at UNED: <http://nlp.uned.es>

**Description:** An information retrieval system which performs the clustering of results by the automatic selection document descriptor, formal concept analysis and latent semantic indexing techniques.

**Functionality:** The IR system analyses the results and retrieves a concept lattice (showing the he most general information on the top and the most specific on the bottom) and allowing the user to browse across the relevant documents in a different fashion.

**Technology:** The system integrates an IR technology with information extraction and formal concept analysis techniques.

**Technical Requirements:** The system needs an IR module which retrieves a set of relevant documents from a query, expressing the user's information needs. The system is currently using the Yahoo! and Google API to

retrieve documents from the Web, but this is an independent module.

**Innovation:** The added value of this technology, which is a result of a research project, is that a new form of exploring the results and browsing across relevant information, is proposed, allowing the non explicit relations discovery.

**Publications:**

J. Cigarrán, A. Peñas, J. Gonzalo, F. Verdejo. 2005. “Automatic selection of noun phrases as document descriptors in an FCA-based Information Retrieval system”. International Conference on Formal Concept Analysis (ICFCA 2005). Lecture Notes in Computer Science. Springer-Verlag, vol. 3403.

J. Cigarrán, J. Gonzalo, A. Peñas, F. Verdejo (2004). “Browsing search results via Formal Concept Analysis: Automatic selection of Attributes”. Concept Lattices Proceedings of the Second International Conference on Formal Concept Analysis (ICFCA 2004). Lecture Notes in Computer Science. Springer-Verlag.

**Contact:** Juan M. Cigarrán <[juanci@lsi.uned.es](mailto:juanci@lsi.uned.es)>, Julio Gonzalo <[julio@lsi.uned.es](mailto:julio@lsi.uned.es)>

## FlickLing

**Authors:** Víctor Peinado, Javier Artiles, Fernando López-Ostenero, Julio Gonzalo

**References:** NLP Group at UNED: <http://nlp.uned.es>

**Description:** FlickLing is a multilingual search interface for Flickr designed and implemented for the CLEF 2008 interactive task.

**Functionality:** FlickLing consists of two interfaces which allow to perform monolingual and multilingual image retrieval over the Flickr database, retrieving results with images annotated in different languages. From a given query entered by the user, FlickLing performs automatic term-by-term translation into up to six languages, and provides assistance for interactive query refinement and translation. Since it has been design with the goal of collecting a large search log, it works as an online competitive game, where users have to find as many images as possible to obtain the highest individual and team scores.

**Modules:** FlickLing search engine consists of two basic components: 1) the graphical user interface which controls the search engine features (queries, ranking of results, etc.), functionalities related to cross-linguality (translations, suggestions, related terms, etc.) and the game-like features of the task (flow of images, users ranking, etc.); 2) a set of web services working behind which are in charge of accessing Flickr, managing the system's databases and generating user logs.

**Technology:** The graphical user interface is implemented in Java using Google Web Toolkit (GWT) and makes extensive use of the GWT-Ext library. The web services are implemented in Python using the TurboGears web application framework. Databases are stored in a MySQL server.

**Technical Requirements:** Most of the Flickling functionalities can be accessed through any modern web browser (Firefox 2 or greater).

**Innovation:** FlickLing is designed as an online competitive game. It allows to perform monolingual and multilingual searches in up to six different languages over the Flickr image collection. The systems captures users' interactions and generates extensive user logs, which are freely available at: <http://nlp.uned.es/iCLEF/2008/iclef2008.logs.zip>.

## **Publications:**

V. Peinado, J. Artiles, J. Gonzalo, E. Barker, F. López- Ostenero. FlickLing: a Multilingual Search Interface for Flickr., Working Notes for the CLEF 2008 Workshop. 2008.

P. Clough, J. Gonzalo, J. Karlgren, E. Barker, J. Artiles, V. Peinado . Large-Scale Interactive Evaluation of Multilingual Information Access Systems - the iCLEF Flickr Challenge. Workshop on Novel Methodologies for Evaluation in Information Retrieval. 30th European Conference on Information Retrieval (ECIR 2008). 2008.

**Contact:** Víctor Peinado <[victor@lsi.uned.es](mailto:victor@lsi.uned.es)>, Julio Gonzalo <[julio@lsi.uned.es](mailto:julio@lsi.uned.es)>

## **IR-n**

**Authors:** Fernando Llopis, José Luis Vicedo, Antonio Ferrández

**References:** GPLSI, Departamento de Lenguajes y Sistemas Informáticos, Universidad de Alicante : <http://gplsi.dlsi.ua.es/mwgpplsi/index.php/Portada>

**Description:** Los sistemas de recuperación de información se encargan de procesar una colección de textos y entre todos ellos seleccionar aquellos que contengan algún término relacionado con la pregunta y descartando los que no estén relacionados. El sistema IR-n es un sistema de recuperación de información basada en pasajes que utiliza un modelo probabilístico como motor de búsqueda y además utiliza un módulo de expansión de la pregunta que mejora los resultados obtenidos. Este sistema ha participado en concursos internacionales como el CLEF.

**Functionality:** Sistema de recuperación de información basado en pasajes.

**Technology:** Se basa en tecnología propia de los sistemas de RI, programado en C++.

**Technical Requirements:** Plataforma Linux

**Innovation:** Lo que diferencia a este sistema respecto a otros sistemas de RI basados en pasajes es que IR-n utiliza la frase como unidad para la definición de pasajes lo que garantiza una estructura sintáctica completa en los pasajes utilizados.

## **Publications:**

Llopis F., A. Ferrández, J.L. Vicedo “Selección de pasajes para facilitar el proceso de búsqueda de respuestas”. Procesamiento Lenguaje Natural. Número 29, Pags. 273-280, Septiembre 2002

Llopis, F., A. Ferrández, J.L. Vicedo, “Utilización de pasajes de tamaño variable para mejorar el proceso de recuperación de información”. Procesamiento Lenguaje Natural. Número 23, Pags. 47-53, Septiembre 1998.

Llopis, F.: IR-n: Un Sistema de Recuperación de Información Basado en Pasajes. PhD thesis, University of Alicante (2003) .

Vicedo, J.L, Llopis, F., Ferrández, A. “University of Alicante. Experiments at TREC-2002”. Eleventh Text REtrieval Conference (TREC-11). Gaithersburg. Maryland (EEUU). November 2002. NIST Special Publication 500-250. Gaithersburg, US. Noviembre 2002.

**Contact:** Fernando Llopis <[llopis@dlsi.ua.es](mailto:llopis@dlsi.ua.es)>

### 3.3 Sistemas de Búsqueda de Respuestas

#### SQUASH

**Authors:** César de Pablo-Sánchez, Paloma Martínez-Fernández, José Luis Martínez-Fernandez, Maria Teresa Vicente-Díez (Universidad Carlos III de Madrid), Antonio Moreno Sandoval, Ana García-Ledesma (Universidad Autónoma de Madrid).

**References:** The Advanced Databases Group (Labda-UC3M) of Universidad Carlos III de Madrid, and the “Laboratorio de Lingüística Informática” of Universidad Autónoma de Madrid (LLI-UAM), are well-known research groups, with ample activity in several Natural Language Processing and Information Retrieval issues.

**Description:** SQUASH is a modular question answering system for the Spanish language. It enhances traditional search engine functionality by providing precise answers in real time to questions in natural language like “¿Cuándo se firmó el Tratado de Maastrich? (When was the Maastricht treaty signed?)”. It reduces significantly the time a user must spend searching for precise information in textual databases.

**Functionality:** The system is composed of rules to select the type of information needed by a question and generate a suitable query for an information retrieval system. It also includes information extraction components to select and rank from documents appropriate sentences and answers.

**Technology:** The system integrates technology for question analysis, information extraction and information retrieval.

**Technical Requirements:** The system is implemented in Java and requires modules for Information Retrieval (IR) and Language Analysis. Several IR systems have been integrated (Lucene, Xapian and Google API). Currently Daedalus STILUS is used for Language Analysis.

**Modules:** Modules for preprocessing information includes language analysis and indexing libraries. Modules for online querying perform question classification, question analysis, query generation, sentence retrieval, answer extraction and answer ranking.

**Innovation:** SQUASH is the result of advances in natural language processing (technological push) and the need of fast semantic search engines to alleviate information overload (market pull). The system provides precise answer from Spanish in real time.

**Development:** SQUASH has been the result of the joint collaboration of a multidisciplinary team of researchers from the Universidad Carlos III de Madrid, Universidad Politécnica de Madrid and from the Universidad Autónoma de Madrid. It has been developed during more than 4 years, from the experience gained in several funded research projects. It has been independently evaluated in CLEF (Cross Lingual Evaluation Forum).

#### Publications:

de Pablo-Sánchez, C., González-Ledesma, A., Martínez-Fernández, J., Guirao, J., Martínez, P. and Moreno, A. "MIRACLE's Cross-Lingual Question Answering Experiments with Spanish as a Target Language," *Accessing Multilingual Information Repositories* (), 2006, pp. 488--491.

de Pablo-Sánchez, C., González-Ledesma, A., Moreno, A. and Vicente, M. T. "MIRACLE experiments in QA@CLEF 2006 in Spanish: main task, real-time QA and exploratory QA using Wikipedia (wiQA)," *Evaluation of Multilingual and Multi-modal Information Retrieval* (4730/2007), 2007, pp. 463-472.

**Contact:** Paloma Martínez Fernández <[pmf@inf.uc3m.es](mailto:pmf@inf.uc3m.es)>

# Ihardetsi

**Authors:** IXA group

**References:** <http://sisx04.si.ehu.es:8080/IhardetsiWebDemo/IhardetsiBezerao.jsp>

**Description:** Ihardetsi is a question answering system for Basque. It is a general platform which architecture pays special attention to: 1) the integration of the development and evaluation environments, and 2) the systematic use of XML declarative files to control the execution of the modules and the communication between them. It can work in a multilingual environment (see QA@CLEF 2008 evaluation forum) using MT systems.

**Functionality:** QA for Basque.

**Technology:** C++, XML.

**Technical Requirements:** -

**Modules:** The current version has three main modules, as it is very common in the question answering systems: Question analysis, Passage retrieval and Answer extraction.

**Innovation:** It is the first QA system for Basque.

**Development:** Different projects funded by the Basque government

**Publications:**

Ansa O., Arregi X., Otegi A., Valverde A.. An XML Framework for a Basque Question Answering System. 7th International Conference on Flexible Query Answering Systems. Milano, Italia. (ISSN 0302-9743, ISBN 3-540-34638-4, pp 577-588). 2006.

Ansa O., Arregi X., Otegi A., Sorazuze A. Ihardetsi question answering system at QA@CLEF 2008. Working Notes of the Cross-Lingual Evaluation Forum, Aarhus, Denmark. ISBN 2-912335-43-4, ISSN 1818-8044. 2008.

**Contact:** Iñaki Alegria <[i.alegria@ehu.es](mailto:i.alegria@ehu.es)>

### **3.4 Sistemas de Traducción Automática**

#### **Matxin**

**Authors:** IXA group

**References:** <http://www.opentrad.org/index.php?idioma=eu>, <http://matxin.sourceforge.net>

**Description:** Matxin is Transfer-based MT system from Spanish into Basque. It is an open, reusable and interoperable framework which can be improved in the next future combining it with the statistical model. The MT architecture reuses several open tools and it is based on an unique XML format for the flow between the different modules, which makes easier the interaction among different developers of tools and resources. Being Basque a resource-poor language this is a key feature in our aim for future improvements and extensions of the engine. The result is an open source software which can be downloaded from [matxin.sourceforge.net](http://matxin.sourceforge.net), and we think it could be adapted to translating between other languages with few resources.

**Functionality:** MT from Spanish to Basque. English to Basque in progress

**Technology:** C++. It uses Freeling for analyzing Spanish or English and Lttoolbox-Apertium for access to the dictionaries. It reuses Basque morphology for morphological generation.

**Technical Requirements:** -

**Modules:** Lexical transfer, structural transfer, syntactical generation and morphological generation.

**Innovation:** It is the first MT system for Basque.

**Development:** OpenTrad and EurOpenTrad projects (Profit)

**Publications:**

Alegria I., Díaz de Ilarraza A., Labaka G., Lersundi M., Mayor A., Sarasola K. Transfer-based MT from Spanish into Basque: reusability, standardization and open source. LNCS 4394. 374-384. Cicing 2007. ISBN-10: 3-540-70938-X ISSN 0302-9734. 2007.

**Contact:** Iñaki Alegria <[i.alegria@ehu.es](mailto:i.alegria@ehu.es)>

## 3.5 Sistemas de Resumen Automático

### LCsum

**Authors:** Maria Fuentes, Horacio Rodríguez and Edgar González.

**References:** <http://nidhoggr.lsi.upc.edu/~demo/summary.html>

**Description:** A summarizer for different tasks involving aspects related with the language, the media and the domain of the document to be summarized.

**Functionality:** Currently on-line summarization of generic or scientific textual or spontaneous speech documents in English.

**Technology:** The summarizer is developed in Perl, and a specific wrapper is developed when some component using different technology is included (Freeling, TNT, YAMCHA, ...).

**Technical Requirements:** The summarizer requires a linguistic preprocess. For Catalan and Spanish Freeling and euroWordnet are used, while TNT, WordNet and YAMCHA are used to process English spontaneous speech documents.

**Modules:** Linguistic preprocessing; Lexical chain based summarizer (includes: Discourse Marker annotator, Text Tiler, Lexical Chainer and chunkSum).

**Innovation:** -

**Development:** The FEMsum was developed for Maria Fuentes' Phd thesis within the framework of the HERMES, ALIADO and CHIL projects.

#### **Publications:**

Maria Fuentes. "A Flexible Multitask Summarizer for Documents from Different Media, Domain, and Language". Ph.D. Thesis on Artificial Intelligence, Advisor Horacio Rodríguez. March, 2008.

Maria Fuentes, Edgar González, Horacio Rodríguez, Jordi Turmo, Laura Alonso. "Summarizing Spontaneous Speech Using General Text Properties". In Proceedings of the Crossing Barriers in Text Summarization Research Workshop held in conjunction with RANLP, Borovets, Bulgaria, September 2005.

Maria Fuentes, Edgar González, and Horacio Rodríguez. "Resumidor de noticies en català del projecte Hermes". II Congrés d'Enginyeria en Llengua Catalana, Andorra, 2004.

Laura Alonso, Maria Fuentes. "Integrating Cohesion and Coherence for Text Summarization". In Proceedings of the EACL'03 Student Session, Budapest, Hungary, April 2003.

Maria Fuentes, Horacio Rodríguez. "Using cohesive properties of text for Automatic Summarization". In Proceedings of the Primeras Jornadas de Tratamiento y Recuperación de Información, Valencia, Spain, 2002.

**Contact:** Maria Fuentes <[mfuentes@lsi.upc.edu](mailto:mfuentes@lsi.upc.edu)>, Horacio Rodríguez <[horacio@lsi.upc.edu](mailto:horacio@lsi.upc.edu)>, Edgar González <[egonzalez@lsi.upc.edu](mailto:egonzalez@lsi.upc.edu)>



## AutoPan

**Authors:** Maria Fuentes, Edgar González and Horacio Rodríguez.

**References:** <http://www.lsi.upc.edu/~egonzalez/autopan.html>

**Description:** AutoPan is a tool that helps in the evaluation of Automatic Summaries. In DUC 2001 to 2004, the manual evaluation was based on comparison with a single human-written model and a lot of the information of evaluated summaries (both human and automatic) was marked as "related to the topic, but not directly expressed in the model summary". The pyramid method (proposed by [Nenkova and Passoneau, 04]) addresses the problem by using multiple human summaries to create a gold-standard and by exploiting the frequency of information in the human summaries in order to assign importance to different facts. However, the method of pyramids for evaluation requires a human annotator to match fragments of text in the system summaries to the SCUs in the pyramids. We have tried to automate this part of the process.

The text in the SCU label and all its contributors is stemmed and stop words are removed, obtaining a set of stem vectors for each SCU. The system summary text is also stemmed and freed from stop words.

A search for non-overlapping windows of text which can match SCUs is carried. A window and an SCU can match if a fraction higher than a threshold (experimentally set to 0.90) of the stems in the label or some of the contributors of the SCU are present in the window, without regarding order. Each match is scored taking into account the score of the SCU as well as the number of matching stems. The solution which globally maximizes the sum of scores of all matches is found using dynamic programming techniques.

The constituent annotations automatically produced are scored using the same metrics as for manual annotations, and it is found that there is statistical evidence supporting the hypothesis that the scores obtained by automatic annotations are correlated to the ones obtained by manual ones for the same system and summary.

**Functionality:** Takes a pyramid file and a summary and produces the peer annotation file that afterwards can be evaluated using the software provided by DUC.

**Technology:** Perl 5.6.0 or greater

**Technical Requirements:** XML::Parser Perl Module; Expat Library

**Modules:** -

**Innovation:**

**Development:** AutoPan was developed for Maria Fuentes' Phd thesis within the framework of the CHIL projects.

**Publications:**

Maria Fuentes, Edgar González, Daniel Ferrés, Horacio Rodríguez. QASUM-TALP at DUC 2005 Automatically Evaluated with the Pyramid based Metric AutoPan DUC 2005 Evaluation Campaign, 2005

Maria Fuentes, Enrique Alfonseca, Horacio Rodríguez "Support Vector Machines for Query-focused Summarization trained and evaluated on Pyramid data". In Proceedings of the ACL 2007, Prague, Czech Republic, June 2007

**Contact:** Maria Fuentes <[mfuentes@lsi.upc.edu](mailto:mfuentes@lsi.upc.edu)>, Edgar González <[egonzalez@lsi.upc.edu](mailto:egonzalez@lsi.upc.edu)>

## 4. Librerías y software de propósito general (en ingeniería lingüística)

### TRIELIB

**Authors:** José M. Goñi-Menoyo, José C. González-Cristóbal (Universidad Politécnica de Madrid), Jorge Fombella-Mourelle, Julio Villena-Román (DAEDALUS-Data, Decisions, and Language, S.A.)

**References:** The “Grupo de Sistemas Inteligentes” (GSI) of Universidad Politécnica de Madrid is a well-known research group with extensive activity in several Natural Language Processing projects.

**Description:** TRIELIB is a trie-based software library aimed to the development of efficient implementations of lexical and morphological components for the management of huge lexicons. Its main feature is that access time for a lexical entry is independent of the lexical database size. In general, the library is an indexing system for huge databases, lexical or not. For instance, an indexing and retrieval system for information retrieval has been built on top of TRIELIB.

**Functionality:** TRIELIB is a management library for indexing textual entries and its associated information.

**Technology:** TRIELIB is implemented in standard C++ suitable for being installed on Linux or Windows platforms.

**Technical Requirements:** GNU C++ development platform.

**Modules:** Basic indexing management library and lexical information management library.

**Innovation:** TRIELIB has been used for building huge lexical access systems and for implementing a continuation-based morphological analyser based on allomorph concatenation model. It benefits from the lexical access system. In addition, it has been also used for implementing an indexing and retrieval system for information retrieval purposes.

**Development:** TRIELIB is the result of the joint collaboration of a team of researchers from Universidad Politécnica de Madrid and from the company DAEDALUS-Data, Decisions and Language, S.A., a spin-off of the GSI university research group. It has been developed during more than 10 years, as a result of the experience gained in several research project.

### Publications:

Goñi-Menoyo, J.M.; Fombella-Mourelle, J.; González-Cristóbal, J.C.; and Villena-Román, J. (2006). Biblioteca “TRIELIB”. Guía de uso. Informe técnico. Universidad Politécnica de Madrid y DAEDALUS-Data, Decisions, and Language.

Right properties / owner: Universidad Politécnica de Madrid and DAEDALUS-Data, Decisions and Language, S.A. The exploitation rights are currently transferred to DAEDALUS-Data, Decisions and Language, S.A.

**Contact:** José Miguel Goñi-Menoyo <[josemiguel.goni@upm.es](mailto:josemiguel.goni@upm.es)>

## JDBIR library

**Authors:** José Manuel Gómez

**References:** GPLSI, Departamento de Lenguajes y Sistemas Informáticos, Universidad de Alicante: <http://gplsi.dlsi.ua.es/mwgpplsi/index.php/Portada>. Disponible en: <http://sourceforge.net/projects/jirs/>

**Description:** Simple gestor de base de datos para el desarrollo de sistemas de recuperación de información.

**Functionality:** Una librería JAVA para crear bases de datos especialmente adaptadas para tratar con ficheros invertidos.

**Technology:** Desarrollado íntegramente en Java.

**Technical Requirements:** Java

**Innovation:** Permite utilizar ficheros invertidos como si se trataran de campos convencionales de una BD.

**Development:** Realizado durante la tesis de José M. Gómez en el marco del proyecto R2D2 (TIC2003-07158C04).

### **Publications:**

Gómez, J.M. “Recuperación de pasajes multilingüe para la búsqueda de respuestas”, Tesis Doctoral. Director: Dr. Emilio Sanchis Arnal. Noviembre, 2007.

**Contact:** José Manuel Gómez <[jmgomez@ua.es](mailto:jmgomez@ua.es)>

## IQmt

**Authors:** Jesús Giménez and Lluís Màrquez

**References:** <http://www.lsi.upc.edu/~nlp/IQMT>

**Description:** A a common workbench on which automatic MT evaluation metrics can be robustly used and combined for the purpose of MT system development. Current version includes a rich set of metrics operating at different linguistic levels (lexical, shallow syntactic, syntactic, and shallow semantic).

**Functionality:** -

**Technology:** Perl

**Technical Requirements:** The following requirements are optional: Individual metrics (BLEU, NIST, GTM, ROUGE, METEOR, ...); Linguistic processors (C&C Tools); SwiRL; BIOS; Charniak Parser; MINIPAR dependency parser; SVMTool.

**Modules:** Metrics: Lexical Similarity; Syntactic Similarity (Shallow parsing, Dependency parsing, Constituency parsing); Semantic Similarity (Named entities, Semantic roles, Discourse representations); QARLA Framework.

**Innovation:** IQmt allows for evaluation of translation quality aspects at different linguistic levels. Metric

scores can also be combined into a single measure of quality, either through QARLA, or via arithmetic mean.

**Development:** -

**Publications:**

Jesús Giménez and Enrique Amigó. IQMT: A Framework for Automatic Machine Translation Evaluation. Proceedings of the 5th International Conference on Language Resources and Evaluation (LREC'06). Genoa, Italy, 22-28 May. 2006. Department Research Technical Report (LSI-07-29-R).

Jesús Giménez and Lluís Màrquez. Linguistic Features for Automatic Evaluation of Heterogeneous MT Systems. Proceedings of WMT 2007 (ACL'07).

Jesús Giménez and Lluís Màrquez. A Smorgasbord of Features for Automatic MT Evaluation. Proceedings of the 3rd ACL Workshop on Statistical Machine Translation (shared evaluation task).

**Contact:** Jesús Giménez <[jgimenez@lsi.upc.edu](mailto:jgimenez@lsi.upc.edu)>

## **MiLL**

**Authors:** Mihai Surdeanu

**References:** -

**Description:** Machine Learning Library. Includes SVM, Maximum Entropy and Perceptron classifiers under a unique and simple interface. All algorithms support multi-class problems.

**Functionality:** -

**Technology:** -

**Technical Requirements:** OpenNLP MaxEnt (included), libsvm.

**Modules:** Multiclass Perceptron; One-vs-rest Perceptron with uneven and dynamic margins; Maximum Entropy; SVM

**Innovation:** MiLL includes the novel Perceptron algorithm with dynamic uneven (?) margins Dr. Surdeanu designed for his ACE Information Extraction system (see publications).

**Development:** -

**Publications:**

Mihai Surdeanu and Massimiliano Ciaramita, Robust Information Extraction with Perceptrons, Proceedings of the NIST 2007 Automatic Content Extraction Workshop (ACE07), March 2007.

**Contact:** Mihai Surdeanu <[mihai@surdeanu.name](mailto:mihai@surdeanu.name)>

## OMLET & FRIES

**Authors:** Xavi Carreras and Lluís Padró

**References:** <http://www.lsi.upc.edu/~nlp/omlet+fries>

**Description:** Omlet is an open source library providing services oriented to easily develop machine-learning based applications and experiments. Fries is an open source library useful to convert natural language sentences to feature vectors suitable to be input to Machine Learning algorithms.

OMLET provides an extensible framework where new ML algorithms and techniques can be integrated, tested, and combined.

FRIES provides an expressive feature definition language that enables the extraction of advanced patterns from input data. FRIES is specially oriented to encode Natural Language sentences and corpora into feature vectors.

OMLET & FRIES are released under the GNU General Public License of the Free Software Foundation

**Functionality:** -

**Technology:** C++

**Technical Requirements:** -

**Modules:** -

**Innovation:** -

**Development:** Omlet was originally written by Xavier Carreras at TALP Research Center at Universitat Politecnica de Catalunya.

Fries is based on the code developed by Dan Roth's Cognitive Computation Group at University of Illinois at Urbana Champaign (UIUC), who we thank for allowing us to distribute our modified version under GPL. Fries generalizes some of the patterns supported by the original FEX to any regular expression, and also adds new feature-building functionalities such as consulting external files.

**Publications:**

Documentation can be found at:

[http://www.lsi.upc.edu/~nlp/omlet+fries/index.php?option=com\\_content&task=view&id=29&Itemid=45](http://www.lsi.upc.edu/~nlp/omlet+fries/index.php?option=com_content&task=view&id=29&Itemid=45)

**Contact:** Lluís Padró <[padro@lsi.upc.edu](mailto:padro@lsi.upc.edu)>

## LabelTranslator

**Authors:** Mauricio Espinoza Mejía, Asunción Gómez-Pérez, Elena Montiel-Ponsoda, Guadalupe Aguado de Cea y Eduardo Mena.

**References:** The Ontology Engineering Group (<http://www.oeg-upm.net/>) at the Artificial Intelligence Laboratory in the Computer Science School at Universidad Politécnica de Madrid (UPM) carries out research on the Ontological Engineering field and the Semantic Web.

**Description:** Ontology localization consists in adapting an ontology to a specific natural language and culture community. LabelTranslator takes as input an ontology or set of ontologies whose labels are specified in a given natural language and obtains the most probable translation of each ontology component label in a target natural language.

**Functionality:** The main functionalities of our tool are: i) obtains a ranked set of translations for each ontology component label, ii) stores the additional linguistic information associated to each label, and iii) uses a synchronization mechanism to maintain ontologies and their associated linguistic information always up to date.

**Technology:** LabelTranslator is implemented in Java suitable for being installed on Linux or Windows platforms.

**Technical Requirements:** LabelTranslator needs NeOn ToolKit version 1.2 and onwards

**Modules:** i) *translation service* automatically obtains a set of applicable translations of an ontology component label, ii) *translation ranking service* sorts these translations according to the similarity with its lexical and semantic context, by means of external lexical resources, and iii) *linguistic model (LIR)* stores the linguistic information associated to the translated label.

**Innovation:** The added value of this technology is the automatization of the localization process which reduces human efforts to localize manually the ontology.

**Development:** This work has been funded by the NeOn project (<http://www.neon-project.org/>).

#### **Publications:**

Mauricio Espinoza, Asunción Gómez-Pérez and Eduardo Mena, "Enriching an Ontology with Multilingual Information", Proc. of 5th European Semantic Web Conference (ESWC'08), Tenerife (Spain), Springer Verlag LNCS, pp. 333-347, June 2008.

Mauricio Espinoza, Asunción Gómez-Pérez and Eduardo Mena, "LabelTranslator - A Tool to Automatically Localize an Ontology", Proc. of 5th European Semantic Web Conference (ESWC'08), Tenerife (Spain), Springer Verlag LNCS, ISBN 978-3-540-68233-2, ISSN-0302-9743, pp. 792-796, June 2008. demo paper.

**Contact:** Asunción Gómez-Pérez <[asun@fi.upm.es](mailto:asun@fi.upm.es)>

## **OMV: Ontology Metadata Vocabulary**

**Authors:** Raúl Palma y Asunción Gómez-Pérez

**References:** Ontology Engineering Group (<http://www.oeg-upm.net/>), UPM.

**Description:** The Ontology Metadata Vocabulary OMV is a standard proposal for describing ontologies and related entities. The OMV metadata schema is formally represented as ontology and is designed modularly: OMV distinguishes between the OMV Core and various OMV Extensions. The core captures information which is expected to be relevant to the majority of ontology reuse settings, while the extensions allow ontology developers and users to specify task/application-specific ontology-related information (e.g. mappings, ontology evaluation, ontology changes etc.).

**Functionality:** OMV provides a basis for an effective access and exchange of ontologies across the web. This standard proposal provides the basis for interoperability at tool level through a common interface to ontology registries/repositories (e.g. Oyster, Centrasite) and related applications like the semantic web

gateway Watson.

**Modules:** OMV distinguishes between the OMV Core and various OMV Extensions. The core captures information which is expected to be relevant to the majority of ontology reuse settings, while the extensions allow ontology developers and users to specify task/application-specific ontology-related information (e.g. mappings, ontology evaluation, ontology changes etc.)

**Innovation:** OMV enables users from academia and industry to identify, find and apply - basically meaning to reuse - ontologies and related entities effectively and efficiently.

**Development:** This work has been funded by the Knowledge Web project (<http://knowledgeweb.semanticweb.org/semanticportal/sewView/frames.html>) and NeOn project (<http://www.neon-project.org>).

#### **Publications:**

Hartmann, J.; Bontas E.; Palma R.; Gómez-Pérez, A.: “DEMO - Design Environment for Metadata Ontologies.” In: Proceedings of the 3rd European Semantic Web Conference, ESWC 2006. Volume 4011. June 2006. Budva, Montenegro. Springer Berlin. 427-441.

Hartmann, J.; Palma, R.; Sure, Y.; Haase, P.; Suarez-Figueroa, M. “OMV– Ontology Metadata Vocabulary”. In: Proceedings of the International Workshop on Ontology Patterns for the Semantic Web, located at the conference International Semantic Web Conference, ISWC2005. November, 2005. Galway, Ireland.

Palma, R., Hartmann, J.; Haase, P. “O M V - Ontology Metadata Vocabulary for the Semantic Web”. Technical Report Version 2.4. 2008. <http://omv.ontoware.org>

**Contact:** Asunción Gómez-Pérez <[asun@fi.upm.es](mailto:asun@fi.upm.es)>

## **Oyster: Distributed Ontology Registry**

**Authors:** Raúl Palma y Asunción Gómez-Pérez

**References:** Ontology Engineering Group (<http://www.oeg-upm.net/>), UPM.

**Description:** Oyster is a distributed registry that exploits semantic web techniques in order to provide a solution for exchanging and re-using ontologies and related entities. It provides services for storage, cataloguing, discovery, management, and retrieval of ontology (and related entities) metadata definition and services to support the management and evolution of ontologies in distributed environments.

**Functionality:** With Oyster each peer has its own local registry of ontology metadata and also has access to the information of other registries, thus creating a virtual decentralized ontology metadata registry. The goal is a decentralized knowledge sharing environment using Semantic Web technologies that allows developers to easily share ontologies and related metadata.

**Innovation:** Users can benefit from services like: Creating and importing metadata, Formulating advanced semantic searches, Management and synchronization of ontology change information and ontology development activities information.

**Technology:** The Oyster system (available at <http://ontoware.org/projects/oyster2/>) was designed using a service-oriented approach, and it provides a well defined API. Accessing the registry functionalities can be done using directly the API within any application, invoking the web service provided or using the included java-based GUI as a client for the distributed registry. Moreover, Oyster is available also as a Plug-in

component within the NeOn toolkit ([www.neon-toolkit.org](http://www.neon-toolkit.org)).

**Technical Requirements:** Oyster implements OMV as the way to describe ontologies and related entities.

**Development:** This work has been funded by the Knowledge Web project (<http://knowledgeweb.semanticweb.org/semanticportal/sewView/frames.html>) and NeOn project (<http://www.neon-project.org>).

**Publications:**

Palma, R.; Haase P.; Gómez-Pérez, A. “Oyster – Sharing and Re-using Ontologies in a Peer-to-Peer Community”. Poster in the Proceedings of the 15th International World Wide Web Conference, WWW'06. May, 2006. Edinburgh, Scotland. ACM. 1009-1010

Palma, R.; Haase, P. “Oyster - Sharing and Re-using Ontologies in a Peer-to-Peer Community”. In: Semantic Web Challenge of Proceedings of the 4th International Semantic Web Conference, ISWC 2005. Volume 3729.

**Contact:** Asunción Gómez-Pérez <[asun@fi.upm.es](mailto:asun@fi.upm.es)>

## InTime Platform

**Authors:** José Manuel Gómez, Sergio Navarro, Patricio Martínez-Barco.

**References:** GPLSI, Departamento de Lenguajes y Sistemas Informáticos, Universidad de Alicante: <http://intime.dlsi.ua.es>

**Description:** Plataforma de integración basada en una arquitectura P2P, que permite compartir y acceder a distintos recursos de Procesamiento del Lenguaje Natural (PLN).

**Functionality:** La plataforma InTime permite conocer, acceder utilizar y compartir datos y herramientas de PLN. Consta de una arquitectura distribuida similar a las redes P2P basada en servicios Web. Los usuarios de InTime tienen la posibilidad de publicar sus propios recursos de PLN y compartirlos con el resto del mundo usando tecnologías de la Web 2.0.

**Technology:** Básicamente, el sistema está desarrollado en Java sobre Tomcat 5.5 , usando servicios Web, pero el Panel de Control Web usa Apache 2 y PHP5.

**Technical Requirements:** JRE 5 , Tomcat 5.5, Apache 2 y MySQL 5

**Modules:** Cliente, Servidor y Panel de Control Web

**Innovation:** El aspecto más importante de InTime es la capacidad de que todo sea transparente al usuario, y que éste no tenga que cambiar su metodología de trabajo.

**Development:** Desarrollado en el marco del proyecto Text-Mess (TIN2006-15265-C06-01).

**Publications:**

Gómez, J.M. “InTiMe: Plataforma de Integración de Recursos de PLN”. Procesamiento del Lenguaje Natural (40), 2008, pp. 83-90. Spain.

**Contact:** José Manuel Gómez <[jmgomez@ua.es](mailto:jmgomez@ua.es)>



## JPM Framework

**Authors:** José Manuel Gómez

**References:** GPLSI, Departamento de Lenguajes y Sistemas Informáticos, Universidad de Alicante: <http://gplsi.dlsi.ua.es/mwgpplsi/index.php/Portada>. Disponible en: <http://sourceforge.net/projects/jirs/>

**Description:** Un framework para el desarrollo de aplicaciones de PLN.

**Functionality:** Permite generar aplicaciones a partir de módulos (procesos y métodos) definidos en un archivo de configuración.

**Technology:** Desarrollado íntegramente en Java.

**Technical Requirements:** Java

**Innovation:** Permite modificar tanto los parámetros como la funcionalidad y el modo de ejecución de las aplicaciones modificando únicamente el archivo de configuración.

**Development:** Proyecto iniciado con la tesis de José M. Gómez en el marco del proyecto R2D2 (TIC2003-07158-C04) y se ha usado en otros proyectos como el Text-Mess (TIN2006-15265-C06-01). Es el núcleo de la plataforma de integración de InTime así como de varios buscadores federados.

### Publications:

Gómez, J.M. “Recuperación de pasajes multilingüe para la búsqueda de respuestas”, Tesis Doctoral. Director: Dr. Emilio Sanchis Arnal. Noviembre, 2007.

**Contact:** José Manuel Gómez <[jmgomez@ua.es](mailto:jmgomez@ua.es)>

## ARIES: A Lexical Base and Platform

**Authors:** José M. Goñi-Menoyo, José C. González-Cristóbal (Universidad Politécnica de Madrid), Antonio Moreno Sandoval (Universidad Autónoma de Madrid).

**References:** The “Grupo de Sistemas Inteligentes” (GSI-UPM) of Universidad Politécnica de Madrid, and the “Laboratorio de Lingüística Informática” of Universidad Autónoma de Madrid (LLI-UAM) are well-known research groups with extensive activity in several Natural Language Processing projects.

**Description:** ARIES is a large lexical database for Spanish language that includes a formalism for lexical representation and a morphological model for inflectional morphology. This model is based on allomorphs, so rules for automatic allomorph generation from lexical roots are also provided.

**Functionality:** The database consists of the lexical database, declarative rules for inflectional morphology and for allomorph expansion, and related documentation .

**Technology:** TRIELIB is a declarative lexical database with no implementation associated. However, a version of the lexical database is translated to Prolog DCG clauses.

**Technical Requirements:** The data needs additional implementation before being processed.

**Modules:** Basic indexing management library and lexical information management library.

**Innovation:** ARIES was developed due to the dramatic lack of lexical resources for Spanish language in 1995.

**Development:** ARIES has been the result of the joint collaboration of a multidisciplinary team of researchers from the Universidad Politécnica de Madrid and from the Universidad Autónoma de Madrid. It has been developed during more than 5 years, from the experience gained in several funded research project.

**Publications:**

Goñi-Menoyo, J.M.; González-Cristóbal, J.C.; and Moreno-Sandoval, A. (1995). Manual de Referencia de la Plataforma Léxica ARIES, versión 5.0. Universidad Politécnica de Madrid.

Right properties / owner: Universidad Politécnica de Madrid and DAEDALUS-Data, Decisions and Language, S.A. The exploitation rights are currently transferred to DAEDALUS-Data, Decisions and Language, S.A.

**Contact:** José Miguel Goñi-Menoyo <[josemiguel.goni@upm.es](mailto:josemiguel.goni@upm.es)>

## QARLA

**Authors:** Enrique Amigó, Julio Gonzalo

**References:** <http://www.lsi.upc.edu/~nlp/IQMT>

**Description:** A framework on which automatic evaluation metrics over reference outputs can be robustly combined for the purpose of machine translation, summarization or language generation system development. This tool allows to combine metrics operating at different linguistic levels (lexical, shallow syntactic, syntactic, and shallow semantic). The framework provides measures to quantify the power of metric combinations and the appropriateness of the testbed.

**Functionality:** -

**Technology:** Perl

**Technical Requirements:** It requires multiple references for each evaluation test case and the evaluation results from each individual metric and each reference.

**Modules:** -

**Innovation:** Metric scores can be combined into a single measure of quality, without depending on scales properties or weighting criteria.

**Development:** This work has been developed in the context of a PhD. thesis.

**Publications:**

Enrique Amigó, Julio Gonzalo, Anselmo Peñas and Felisa Verdejo, QARLA: a framework for the evaluation of text summarization systems. Proceedings of the 43rd Meeting of the Association for Computational Linguistics (ACL 2005). 2005.

Enrique Amigó, Julio Gonzalo, Anselmo Peñas and Felisa Verdejo. Evaluating DUC 2004 Tasks with the QARLA Framework. Proceedings of the ACL 2005 Workshop on Intrinsic and Extrinsic Evaluation

Measures for MT and/or Summarization. 2005.

Enrique Amigó, Julio Gonzalo, Anselmo Peñas and Felisa Verdejo, Evaluación de resúmenes automáticos mediante QARLA. Procesamiento del Lenguaje Natural, N° 35 pp. 59-66, 2005.

Jesús Giménez and Enrique Amigó. IQMT: A Framework for Automatic Machine Translation Evaluation. Proceedings of the 5th International Conference on Language Resources and Evaluation (LREC'06). Genoa, Italy, 22-28 May. 2006. Department Research Technical Report (LSI-07-29-R).

**Contact:** Enrique Amigó <[enrique@lsi.uned.es](mailto:enrique@lsi.uned.es)>

## 5. Otros servicios y *know-how*

### Morphosyntactic Annotation in Spanish Service (PoS and lemmatization)

**Authors:** Antonio Moreno-Sandoval, Head of the Laboratorio de Lingüística Informática (Computational Linguistics Lab) and José María Guirao, Senior Programmer References: The Laboratorio de Lingüística Informática of Universidad Autónoma de Madrid (LLI- UAM, <http://www.llif.uam.es>) is a well-known research laboratory. This lab is linked by the “Bookmarks for Corpus-based Linguists” site by David Lee, as the main reference for Spanish corpora (<http://personal.cityu.edu.hk/~davidlee/devotedtocorpora/corpora2.htm>)

**Description:** GRAMPAL is a morphosyntactic tagger based on a large lexicon and with a disambiguation process based on statistical training. It can be adapted to any language register, ie. spontaneous speech, text corpora, or child language. The precision is over the 95% for any register, but the tagger reaches specially good results with spontaneous speech. The service offered combines the automatic tagging with manual revision of the annotation by linguist experts, providing a totally reliable annotation.

**Functionality:** From every given input text, GRAMPAL outputs the part-of-speech tagging and lemmatisation of every term. The system is trained both for spontaneous speech and written Spanish.

**Technology:** GRAMPAL is implemented in C++ in a linux platform. The technology is a hybrid system based on a large lexicon and in statistical disambiguation.

**Technical Requirements:** The service is obtained through an agreement between both parts. It works like a translation service, that is, the client sends the corpus and the annotated and verified version is returned. This service can be provided both for written and spoken resources. The output can be delivered in any format, ie., XML, plain text and any tagset.

**Modules:** Automatic tagging, and (2) Manual revision by expert linguists, controlled by devoted tool.

**Innovation:** GRAMPAL's main innovation was obtained when it was used in the tagging of the C- ORAL-ROM corpus, an EU-funded project of spontaneous speech resources. It must be pointed out that GRAMPAL has been specially adapted for spoken Spanish, what means a special training with spoken corpora for the disambiguation of PoS candidates.

**Development:** GRAMPAL was the result of a PhD dissertation in 1991, and it has been developed for more than 10 years long by a team of linguists and engineers, as a result of the experience gained in several funded research project.

#### Publications:

Moreno, A. & Guirao, J.M. "Morpho-syntactic Tagging of the Spanish C- ORAL-ROM Corpus: Methodology, Tools and Evaluation.", in Spoken Language Corpus and Linguistic Informatics, John Benjamins, 2006.

Guirao, J.M. y Moreno, A. A "toolbox" for tagging the Spanish C-ORAL-ROM corpus IV International Conference on Language Resources and Evaluation (LREC2004) Proceedings, 2004.

**Contact:** Antonio Moreno-Sandoval <[antonio.msandoval@uam.es](mailto:antonio.msandoval@uam.es)>

# Systemized Process of Corpora Development

**Authors:** Marta Garrote y Antonio Moreno-Sandoval

**Reference:** Laboratorio de Lingüística Informática, UAM: <http://www.llif.uam.es>

**Description:** Systemized process to collect both spontaneous speech and written corpora composed of the following stages (each stage is manually revised by more than one person):

1. Preliminary design considering participants, their socio-linguistic features (age, gender, demographics, linguistic origin, education, etc) and the communicative context. This information may be modified depending on the goals of the study. This design may also be modified according to the variables considered in the study.
2. Data collecting (recording, video captures, editing, etc.)
3. Orthographic transcription (both normative and real speech).
4. Prosodic annotation, marking pauses, vocal lengthening, overlaps, interruptions, intonation, etc.
5. Alignment of text-sound units in utterances.
6. Semi-automatic morpho-syntactic annotation (part-of-speech and lemmas).
7. Automatic phonological annotation.

**Functionality:** Besides the possible application of these data collections, this methodology allows automatic information processing and retrieval at each linguistic level, since all annotations are standardized using XML.

**Technology:** The complete process involves different technologies such as word sense disambiguation, part-of-speech tagging and lemmatization.

**Technical Requirements:** This is a service accessible after signing an agreement or contract with LLI-UAM.

**Innovation:** This service is presented as a result of different R&D projects. Each project focused on the development of one level of analysis, obtaining a complete toolkit. The added value is the systemized methodology that has been successfully proved in the elaboration of different customized corpora.

**Development:** The work has been mainly supported by public funding through research projects. The methodology was acquired during the C-ORAL-ROM corpus, a EU-funded project of the 5 FP.

## Publications:

Cresti, E. Moneglia, M. (eds). 2005. C-ORAL-ROM: Integrated Reference Corpora for Spoken Roman Languages. Amsterdam. John Benjamins.

Garrote. M. CHIEDE: Corpus de habla infantil espontánea del español. PhD Dissertation. Universidad Autónoma de Madrid. 2008.

**Contact:** Antonio Moreno-Sandoval <[antonio.msandoval@uam.es](mailto:antonio.msandoval@uam.es)>