

Livio Robaldo

Curriculum Vitae et Studiorum

Personal Information

<i>Name</i>	Livio
<i>Surname</i>	Robaldo
<i>Date of birth</i>	23/06/1979
<i>Birth place</i>	Turin, Italy
<i>Citizenship</i>	Italian
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<i>Current work position</i>	Postdoc (IT: <i>Assegno di Ricerca</i>) at the Department of Computer Science, University of Turin.

Dr. Livio Robaldo is a **Post-doc Researcher** at the Department of Computer Science, University of Turin. His research is supported by an **Assegno di Ricerca**, an Italian form of Postdoctoral fellowship grant, on the subject ‘Interpretazione del linguaggio naturale e trattamento efficiente di casi rilevanti di ambiguità semantica’ (EN: *Natural Language Interpretation and Efficient Treatment of relevant cases of Semantic Ambiguity*), under the supervision of prof. Leonardo Lesmo.

Livio Robaldo earned a **MSc** and a **Ph.D.** in **Computer Science** from the Department of Computer Science, University of Turin. Afterwards, he spent 5+2 months as a visiting researcher at the University of Pennsylvania, Philadelphia, USA.

His research interests mainly concern the **Semantics of Natural Language**. Currently, he is working on three projects: **Dependency Tree Semantics**, an Underspecified Semantic formalism introduced in his Ph.D. thesis; the **Penn Discourse Treebank**, a corpus devoted to the annotation of discourse connectives, hosted at the Institute for Research in Cognitive Science, University of Pennsylvania; and the **Turin University Treebank (TUT) - Turin University Linguistic Environment (TULE)**, a corpus and a morpho-syntactic analyzer respectively, that annotate Italian sentences in the Dependency Format defined by the Interaction Model Group of the Department of Computer Science, University of Turin.

The results of the research activity of Livio Robaldo have been published in **23** locations: International Journals, Conferences, Workshops, and Technical Reports. His teaching activity includes **464 hours of teaching** in the roles of **Lecturer**, **Teaching Assistant**, and **External Collaborator** for undergraduates, high school students and companies.

Further details may be found below in the respective sections.

Education

Livio Robaldo earned a **MSc in Computer Science** from the Department of Computer Science of the University of Turin, on July 2003, with the final mark of **110 cum laude and mention for the exceptional curriculum**. On February 2007, he earned, from the same department, a **Ph.D in Computer Science**, by defending a thesis titled **Dependency Tree Semantics**. The thesis defines a novel semantic underspecified formalism with the same name. After the defence of his Ph.D. thesis, Livio Robaldo was a visiting researcher at **UPenn** (Philadelphia, USA) from the 5th of February 2007 to the 30th of June 2007, and again two years later, from the 12th of June 2009 to the 27th of July 2009. Further details are reported below.

<i>June–July 2009</i>	Visiting researcher at Penn University , Philadelphia, USA. Scientific supervisors: Prof. Eleni Miltsakaki, Prof. Aravind Joshi.
<i>February–June 2007</i>	Visiting researcher at Penn University , Philadelphia, USA. Scientific supervisor: Prof. Maribel Romero.
<i>February 2007</i>	Ph.D. in Computer Science (XIX cycle) , Department of Computer Science, University of Turin.
<i>September 2004</i>	Winner of premio Optime , Confindustria award given to the best graduates of the University and Polytechnic of Turin, for the Academic year 2003-2004.
<i>July 2003</i>	MSc in Computer Science , with the final mark of 110 cum laude and mention for the exceptional curriculum , Department of Computer Science, University of Turin.
<i>July 1998</i>	Technical-Industrial Diploma in Computer Science , with the final mark of 54/60 , ITIS “A. Avogadro”, Turin.

Ph.D Thesis:

<i>Title:</i>	Dependency Tree Semantics
<i>Supervisor:</i>	Prof. Leonardo Lesmo
<i>External reviewers:</i>	Prof. Maribel Romero (Penn University, Philadelphia, USA) Dr. Johan Bos (Università “La Sapienza”, Roma, Italy)
<i>Description:</i>	Dependency Tree Semantics (DTS) is a novel semantic formalism for underspecifying the scope of NL quantifiers. The key idea is to achieve underspecification via Skolem-like dependencies. DTS presents two main advantages with respect to its contemporary proposals. First of all, it enables the representation of readings where two or more sets of entities are independent of one another, and so must be interpreted in parallel. Second of all, it allows for a direct syntax-semantic interface, with respect to a Dependency Tree, without preventing incremental disambiguations.

MSc Thesis:

Titolo: **Utilizzo di risorse lessicali nell'interpretazione semantica dell'analisi del linguaggio naturale (EN: Use of lexical resources for the semantic interpretation of the analysis of NL)**

Relatore: Prof. Leonardo Lesmo

Descrizione: Design and implementation of a semantic component aiming at improving the performance of the Turin University Linguistic Environment (TULE), a morpho-syntactic analyzer developed at the Department of Computer Science, University of Turin. The semantic component applies selectional restrictions on verbal arguments by querying the ItalianWordNet ontology, developed at the ITC-IRST, Trento, Italy. The results of the selectional restrictions are then given back to TULE, which exploits them for building the proper dependency relations on the final syntactic tree.

Doctoral schools:

- Biss 2004: Bertinoro International Spring School 2004, Bertinoro (Forlì).
- International Doctoral School "Chambery-Torino": International Doctoral School in Theoretical Computer Science and Semantic Web, Aussois (Savoie-France).
- Esslli 2005: 17th European Summer School in Logic, Language and Information, Edinburgh.

Conferences and Workshops:

- 8th Int. Workshop on Computational Semantics, (IWCS-8) 7-9 January 2009.
- Symposium on semantics in systems for text processing, (STEP-08) 22-24 September 2008.
- 15th Workshop on Logic, Language, Information and Computation (WoLLIC-08), 1-4 July 2008.
- 3rd Workshop on Formal Ontologies Meet Industry (FOMI-08), 5-6 June 2008.
- 9th Int. Conf. on Intelligent Text Processing and Computational Linguistics (CicLing-08), 17-23 February 2008.
- 10th Congress of the Italian Association for Artificial Intelligence, 10-13 September 2007.
- 7th Int. Workshop on Computational Semantics (IWCS-7), 10-12 January 2007.
- Int. Symposium on Methodologies for Intelligent Systems' (ISMIS-06), 27-29 September 2006.
- XL Congress of the Italian Linguist Society, 21-23 September 2006.
- 5th Conference 'Inference in computational semantics' (ICOS-5), 20-21 April 06.
- 2th Int. Conference on the Meaning \Leftrightarrow Text Theory (MTT-05), 23-25 June 2005.
- 6th Int. Workshop on Computational Semantics (IWCS-6), 12-14 January 2005.
- Int. Conf. on Formal Ontologies in Information Systems (FOIS-04), 4-6 November 2004.

Work Positions

Livio Robaldo is currently a **Post-doc Researcher** at the Department of Computer Science, University of Turin. His research is supported by an **Assegno di Ricerca**, an Italian form of Postdoctoral fellowship grant. In the past, he received another Assegno di Ricerca and he worked on the **European Project HOPS**. His teaching activity includes 464 hours of teaching in different roles, among which **Lecturer**.

Mar 2008 - Today

Post-doctoral fellow (IT: Assegno di Ricerca) with a grant on ‘Interpretazione del linguaggio naturale e trattamento efficiente di casi rilevanti di ambiguità semantica’ (EN: *Natural Language Interpretation and Efficient Treatment of relevant cases of Semantic Ambiguity*), Department of Computer Science, University of Turin. Scientific advisor: prof. Leonardo Lesmo.

Nov 2006 - Feb 2008

Post-doctoral fellow (IT: Assegno di Ricerca) with a grant on ‘Interpretazione del linguaggio naturale’ (EN: *Natural Language Interpretation*), Department of Computer Science, University of Turin. Scientific advisor: prof. Guido Boella.

Gen 2007 - Today

Teaching Contracts for teaching activities as Lecturer in University, Teaching Assistant, and external Collaborator. More details in the ‘Teaching Activity’ section below.

Feb 2004 - Oct 2005

Short Term Researcher for the European project HOPS (Enabling an Intelligent Natural Language based Hub for the Deployment of Advanced Semantically Enriched Multi-channel Mass-scale Online Public Services).

Nov 1999 - Jun 2001

Junior Programmer, HTP Technology, Grugliasco (TO). Software design of computer-telephone interfaces.

Research Activities

Livio Robaldo is currently working on several research topics. Among them, the most important three are: **NL Quantification/Semantic Underspecification**, **Discourse Semantics**, and **Dependency Parsing**. He is also working on **Formal Ontologies** and **Anaphora Resolution**.

Livio Robaldo is also a skilled **Java programmer**. He aims at implementing in Java a full framework for NL analysis where the results of each of his research activities are integrated and tested.

With respect to this goal, he built a Java interface for the TULE Parser (see below in ‘Dependency Parsing’ subsection). In the near future, he aims at implementing the whole Parser in Java.

Afterwards, it will be possible to define a compositional and underspecified syntax-semantic interface, with respect to the logical framework defined in [Robaldo, 09.a-c], along the lines outlined in Livio Robaldo’s Ph.D thesis and in [Robaldo and Di Carlo 09], and to easily exploit OWL ontologies in the system in order to perform disambiguation and to improve the overall performance.

The next subsections briefly describe the results and the ongoing work in each research activity.

NL Quantification / Semantic Underspecification

In his Ph.D. thesis, Livio Robaldo proposed a new semantic underspecified formalism, termed ‘Dependency Tree Semantics’ (DTS). DTS is able to underspecify quantifier scope via Skolem-like constructs. Underspecified formalisms have been recently introduced in the field of NL Semantics in order to provide a flexible solution to Semantic Ambiguities, usually Semantic Scope Ambiguities. Semantic Scope Ambiguities arise when scope-bearers like quantifiers, adverbs, intensional verbs, etc. may interact to each other in different ways, leading to different interpretations.

In DTS, ambiguities on the sets of entities involved are represented via functional dependencies, i.e. Skolem-like functions, that may be underspecified. Well-formed structures in DTS are graphs between predicates, denoted by content words like verbs, nouns, etc., and discourse referents, denoted by quantifiers, determiners, proper names, etc. Those graphs constitute a semantic underspecified representation of the sentence. In order to disambiguate quantifier scope ambiguities, further functional dependencies between discourse referents are inserted. They resemble Skolem functions.

DTS focuses on scope ambiguities arising from quantifiers only. The reason why the attention was restricted to them is that they appear to be different from other scope ambiguities. Quantifiers and determiners introduce sets of entities on which the predications are asserted. Depending on how quantifiers are ordered, the NL sentence refers to different sets of entities. Conversely, modals, adverbs, and other scope-bearers contribute to the predications. Different choices in their scopings lead to different predications, which are asserted on the sets of entities.

In the light of this, it is necessary to distinguish between terms and predicates, as in standard logics, in that it does not seem to be possible to deal with them both via the same formal constructs.

Future works on DTS include the introduction of events variable in order to deal with other kinds of semantic ambiguities, and the incorporation of constraints involved in the disambiguation, e.g. Island constraints, constraints coming from world-knowledge/ontologies, the topic/focus structure, etc. [Robaldo and Di Carlo, 09] presents a preliminary extension of DTS in that sense.

Independent Set Readings: By allowing disambiguation in terms of functional dependencies rather than in terms of quantifier scope embeddings, we achieve the expressivity needed to represent readings where two or more sets of entities are independent of one another. Those reading have been termed in [Robaldo, 09c] as ‘Independent Set readings’. In the literature, three main kinds of IS readings have been identified, depending on how the predications apply to the independent sets:

- (1) IS readings with distributive predication (IS-dis), e.g. *Two examiners marked six scripts.*
- (2) IS readings with collective predication (IS-col), e.g. *Three boys lift a piano.*
- (3) IS readings with cumulative predication (IS-cum), e.g. *Three monkeys ate all our bananas.*

In the example given in (1), by allowing both NPs to receive wide scope and by interpreting the main verb distributively, we get a reading where there is a set of two examiners and a set of six scripts and each of the two examiners marked each of the six scripts. The example given in (2) is an archetypal example of the so-called collective readings. The sentence may receive an interpretation where the three boys lift a single piano with a joint effort. Finally, the meaning of “eat” favours a so-called cumulative interpretation for the example given in (3). The sentence says that the union/cumulation of the bananas singularly eaten by each of the three monkeys includes the set of all our bananas.

Defining a model theory for IS readings is rather complex, in that the incorporation of independent sets in the standard Generalized Quantifier approach requires the introduction of particular clauses termed Maximality Conditions. Those require the involved sets of entities to be the maximal sets that satisfy the predications. [Robaldo, 09c] defines a logical framework that generates Second Order Logic formulae able to represent the truth conditions of IS-dis reading and non-IS (linear) reading. Livio Robaldo’s Ph.D. thesis defines an algorithm to translate DTS fully disambiguated structures into those formulae. On the other hand, [Robaldo, 09b] studies how interpretation and inference are carried out on the maximal terms occurring in the formulae in [Robaldo, 09c].

Finally, [Robaldo, 09a] contains an extension of the logical framework in [Robaldo, 09c] able to describe any IS reading, including IS-col and IS-cum readings, as well as any basic non-IS reading.

Discourse Semantics

During his first visiting period at the University of Pennsylvania, Livio Robaldo started collaborating with the Penn Discourse Treebank (PDTB) research group. The Penn Discourse Treebank is a corpus developed at the Institute for Research in Cognitive Science of the University of Pennsylvania (UPenn). The PDTB is, to date, the largest annotation effort at the discourse level, providing annotations of explicit and implicit discourse connectives. It provides annotations of the argument structure, attribution and semantics of discourse connectives. PDTB annotations relate a discourse connective with its two arguments. For instance, in the following sentence, the underlined discourse connective “since” relates the two sentence-arguments, respectively in italics and boldface.

She hasn't played any music since *the earthquake hit*

Livio Robaldo helped the writing of the the PDTB 2.0 annotation manual [Prasad et al. 08a], and the sense annotation in the release 2.0 of the corpus [Miltsakaki et al., 2008]. Later, he focuses on Concessive relation, which appear to be one of the trickiest semantic discourse relations. Concession is a semantic relation between two sentence-arguments where one of them creates an expectation and the other one denies it. Typical discourse connectives that convey Concession are “although”, “but”, “however”, etc. Some examples of PDTB occurrences tagged as Concession are:

1. Although *they represent only 2% of the population*, **they control nearly one-third of discretionary income.**
2. **The Texas oilman has acquired a 26.2% stake valued at more than \$1.2 billion in an automotive-lighting company, Koito Manufacturing Co.** But *he has failed to gain any influence at the company.*
3. **Mr. Cannell's allegations of cheating “are purely without foundation”, and based on unfair inferences.** However *the state will begin keeping closer track of achievement-test preparation booklets next spring.*

[Robaldo et al, 2008] represents a first attempt to explain where the expectations come from. In the paper, it is claimed that Concession arises when the context include two constrasting causal rules. The argument that denies the expectation, being the stronger one, overwrites the effects of the causal rule conveyed by the other (weaker) argument. The papers formalizes the proposed semantics of Concession in the logical framework of Jerry R. Hobbs, who is also a coauthor of the paper.

After [Robaldo et al, 2008], other semantic relations that may be trigger expectations from the first argument have been identified. Livio Robaldo, together with Eleni Miltsakaki, is currently trying to define an overall semantics of Concession and to conduct an empirical study on the PDTB corpus, in order to check the validity of the formulae against real data.

Dependency Parsing

Livio Robaldo collaborates in the development of the **Turin University Linguistic Environment (TULE)** and the **Turin University Treebank (TUT)**. The former is a morpho-syntactic analyzer, the latter a corpus including almost 3000 Italian sentences. To date, TUT is the largest syntactic treebank for Italian. The two instruments share the same format: the Dependency Format defined by the Interaction Model Group of the Department of Computer Science (visit the url <http://www.di.unito.it/~tutreeb>). TULE has been developed by prof. Leonardo Lesmo during the past decades. It is written in Lisp, and currently supports four languages (Italian, English, Spanish, Catalan). Nevertheless, it has good performances for Italian only, while the improvement of its performance in the other supported languages is seen as the object of future research. TULE was used for the semi-automatic annotation of the sentences in TUT.

Livio Robaldo made TULE available to the scientific community by adding instructions that converted it as a Server. Then he developed a user-friendly **Java GUI Client** to TULE. The Client allows to contact the TULE Server via Internet, send it NL sentences, retrieve the corresponding syntactic analyses, and display them in a graphical format. The Client is available as a jar file at <http://www.tule.di.unito.it>, under the ‘Download’ section. If a proper Java virtual machine is installed, the interface runs simply by double-clicking on the jar file. From the TULE homepage, it is also possible to download and install the whole TULE Server. The Client may be easily configured to contact the Server on localhost, according to the instructions provided at the TULE homepage.

Formal Ontologies

Livio Robaldo carried out research on formal ontologies at three different times: during his MSc degree, when he worked on the project HOPS, and in the role of seminar lecturer within the course of ‘Interazione Uomo-Macchina II’ (EN: *Human-machine Interaction II*) at the Department of Computer Science.

During his MSc degree, he implemented a semantic module in the TULE parser (see previous subsection), in order to improve the overall performance of the latter. The semantic module applied selectional restrictions on verbal arguments by querying the ItalianWordNet ontology.

During the European Project HOPS, he worked at the integration of ad-hoc OWL ontologies in the TULE Parser. The ontologies have been developed by means of Protégé by another partner of the project. Livio Robaldo implemented a Java converter, importing the Jena libraries, in order to convert OWL into a lisp-readable format. During the activity, Livio Robaldo became an expert in OWL and Protégé so that he was requested to teach the instruments at the students of ‘Interazione Uomo-Macchina II’, and to assist them during the building of little toy ontologies in OWL.

The research activity done by Livio Robaldo in the HOPS project has been documented in [Lesmo and Robaldo 07c], [Lesmo and Robaldo 07a], and [Lesmo and Robaldo 06a].

Anaphora Resolution

Recently, Livio Robaldo started working on Anaphora Resolution. In particular, he (informally) collaborates with the University of Trento in the **AnaWiki Project** (<http://anawiki.essex.ac.uk>). The aim of AnaWiki is the development of tools to allow and encourage large numbers of volunteers over the Web to collaborate in the creation of semantically annotated corpora. Livio Robaldo is an Expert Player of the **Phrase Detective** game (<http://anawiki.essex.ac.uk/phrasedetectives>). Phrase Detective aims at building a large corpus of anaphoric expressions. Players are requested to associate anaphoric expressions with their referents.

Livio Robaldo, together with Prof. Massimo Poesio, is currently studying how it would be possible to make the game available in Italian. To this end, he developed a Java converter from TULE (that will be used to syntactically analyze the input text) to the XML format used in the Phrase Detective framework. In the near future, TULE and the Java converter will be deployed in the Phrase Detective framework, thus making possible the annotation of Italian anaphoric expressions.

Publications

International Journals

- [Robaldo 09b] L. Robaldo: *Interpretation and Inference with Maximal referential terms*, The Journal of Computer and System Sciences. 2009. (**ISI IF: 1.244**) (**GRIN: A**). In press.
- [Robaldo 09a] L. Robaldo: *Independence Set readings and Generalized Quantifiers*, The Journal of Philosophical Logic. 2009. In press.

Lecture Notes and GRIN¹ conferences/workshops

- [Robaldo and Di Carlo 10] L. Robaldo and J. Di Carlo: *Flexible disambiguation in Dependency Tree Semantics*, In Proc. of the 9th International Conference on Intelligent Text Processing and Computational Linguistics (CicLing-2010), Iasi, Romania, 2010. Lecture Notes In Computer Science, Springer.
- [Robaldo and Di Carlo 09] L. Robaldo and J. Di Carlo: *Disambiguating quantifier scope in Dependency Tree Semantics*, In Proc. 8th International Workshop on Computational Semantics (IWCS-8), Tilburg, The Netherlands, 2009 (**GRIN: C**).
- [Robaldo 08] L. Robaldo: *Skolem theory and Generalized Quantifiers*, In Proc. of 15th Workshop on Logic, Language, Information and Computation (WOLLIC-08), Edinburgh, Scotland, 2008. Lecture Notes In Artificial Intelligence (LNAI, vol. 5110), Springer. (**GRIN: B**).
- [Prasad et al. 08a] R. Prasad, N. Dinesh, A. Lee, E. Miltsakaki, L. Robaldo, A. Joshi, B. Webber: *The Penn Discourse Treebank 2.0*, In Proc. of 'Lexical Resources and Evaluation Conference' (LREC2008), Marrakech, Morocco, 2008 (**GRIN: B**).
- [Miltsakaki et al. 08] E. Miltsakaki, L. Robaldo, A. Lee, A. Joshi: *Sense annotation in the Penn Discourse Treebank*, In Proc. of the 9th International Conference on Intelligent Text Processing and Computational Linguistics (CicLing-2008), Haifa, Israel, 2008. Lecture Notes In Computer Science (LNCS, vol. 4919), Springer.
- [Robaldo 07a] L. Robaldo: *Dependency Tree Semantics*, In Proc. 7th International Workshop on Computational Semantics (IWCS-7), Tilburg, The Netherlands, 2007 (**GRIN: C**).
- [Robaldo 07b] L. Robaldo: *Dependency Tree Semantics: Branching quantification in Under-specification*, In Proc. of 10th Congress of the Italian Association for Artificial Intelligence (AIIA-07), Rome, 2007. Lecture Notes In Artificial Intelligence (LNAI, vol.4733), Springer. (**GRIN: B**).
- [Lesmo and Robaldo 07c] L. Lesmo and L. Robaldo: *Use of ontologies in Practical NL Query Interpretation*, In Proc. of 10th Congress of the Italian Association for Artificial Intelligence (AIIA-07), Rome, 2007. Lecture Notes In Artificial Intelligence (LNAI, vol.4733), Springer. (**GRIN: B**).
- [Lesmo and Robaldo 06b] L. Lesmo, L. Robaldo: *Dependency Tree Semantics*, In Proc. of 16th International Symposium on Methodologies for Intelligent Systems (ISMIS2006), Bari, 2006. Lecture Notes In Artificial Intelligence (LNAI, vol.4203), 550-559, Springer. (**GRIN: B**).

¹<http://www.di.unipi.it/grin/Classif.Conferenze2000.html>.

- [Lesmo and Robaldo 06a] L. Lesmo, L. Robaldo: *From Natural Language to Databases via Ontologies*, In Proc. of ‘Lexical Resources and Evaluation Conference’ (LREC2006), Genova, Italy, 2006 (**GRIN: B**).
- [Lesmo and Robaldo 05] L. Lesmo, L. Robaldo: *From Dependency Tree Semantics to FOL*, In Proc. of 6th International Workshop on Computational Semantics (IWCS-6), Tilburg, The Netherlands, 2005, 384-386 (**GRIN: C**).

International Conferences

- [Robaldo et al. 08] L. Robaldo, E. Miltsakaki, J. R. Hobbs: *Refining the Meaning of Sense Labels in PDTB: “Concession”*, In Proc. of Symposium on semantics in systems for text processing (STEP2008), Venice, Italy, 2008.
- [Lesmo et al. 07] L. Lesmo, L. Robaldo, S. Villata: *Meaning \Leftrightarrow Text theory and Dependency Tree Semantics: an account of Underspecification*, In Proc. of 3th International Conference on the Meaning \Leftrightarrow Text Theory (MTT-2007), 257-267, Klagenfurt, Austria, 2007.
- [Lesmo and Robaldo 07a] L. Lesmo, L. Robaldo: *Access to Cultural Event Information via NL*, In Proc. of International Conference On Natural language processing (ICON2007), Hyderabad, India, 2007.
- [Lesmo et al. 06b] L. Lesmo, L. Robaldo and J. Gerbrandy: *Quantifier in Dependency Tree Semantics*. In Proc. of 5th conference ‘Inference in computational semantics’, 47–57, Buxton, England, 2006.
- [Lesmo and Robaldo 05] L. Lesmo, L. Robaldo: *Underspecification of Quantifier Scope in MTT*, In Proc. of 2th International Conference on the Meaning \Leftrightarrow Text Theory (MTT-2005), 248–257, Moscow, Russia, 2005.
- [Lesmo and Robaldo 04] L. Lesmo, L. Robaldo: *Dependency Tree Semantics and Underspecification*, In Proc. of International Conference On Natural language processing (ICON2004), Hyderabad, India, 2004.

Workshops, National Conferences e Technical Reports

- [Prasad et al. 08b] R. Prasad, E. Miltsakaki, N. Dinesh, A. Lee, A. Joshi, B. Webber, and L. Robaldo. *The Penn Discourse Treebank 2.0. Annotation Manual*. IRCS Technical Report, IRCS-06-01, Institute of Research in Cognitive Science, University of Pennsylvania.
- [Champollion et al. 07] L. Champollion, P. Mannem, L. Robaldo: *Bidirectional dependency parsing trained on the Turin University Treebank*. Proc. of 1st “Evaluation of NLP Tools for Italian” workshop (EVALITA-2007), collocated at the 10th Congress of the Italian Association for Artificial Intelligence (AIIA-07), Rome, 2007.
- [Lesmo and Robaldo 07b] L. Lesmo, L. Robaldo: *Monotonic disambiguation in Dependency Tree Semantics*, In Proc. of Workshop on Modeling and Representation in Computational Semantics, collocated at the 27th International Joint Conference of Artificial Intelligence (IJCAI-07). Hyderabad, India, 2007.
- [Lesmo et al. 06a] L. Lesmo, L. Robaldo and J. Gerbrandy: *Quantifier in Dependency Tree Semantics*, In Proc. of XL Congresso della Società di Linguistica Italiana, Vercelli, 2006.

Teaching activity

- October 2008* **Teaching Assistant** of the undergraduate course of “Laboratorio di Servizi Web” (EN: *Web Services laboratory*), Faculty of Mathematical, Physical, and Natural Sciences, University of Turin, 25 hours of teaching.
- October 2008* **Lecturer** of the undergraduate course “Informatica applicata alla Comunicazione Multimediale” (EN: *Computer Science applied to Multimedia Communication*), Master Degree in “Traduzione” (EN: *Translation*), Faculty of Languages and Foreign literature, University of Turin, Academic year 2008/2009, 60 hours of teaching.
- October 2008* **Teaching Assistant** of the undergraduate course of “Programmazione I-II e Laboratorio” (EN: *Computer programming I-II and laboratory*), Faculty of Mathematical, Physical, and Natural Sciences, University of Turin, 50 hours of teaching.
- November 2007* **External Collaborator** for the teaching of XML and SQL, at Valtec s.r.l. company, Turin. Six working days of teaching.
- October 2007* **Lecturer** of the undergraduate course “Informatica applicata alla Comunicazione Multimediale” (EN: *Computer Science applied to Multimedia Communication*), Master Degree in “Traduzione” (EN: *Translation*), Faculty of Languages and Foreign literature, University of Turin, Academic year 2007/2008, 30 hours of teaching.
- October 2007* **Teaching Assistant** of the undergraduate course of “Programmazione I-II e Laboratorio” (EN: *Computer Programming I-II and Laboratory*), Faculty of Mathematical, Physical, and Natural Sciences, University of Turin, 50 hours of teaching.
- October 2007-2008* **External Collaborator** for the projects “Analisi computazionale del linguaggio naturale” and “Logica Proposizionale” (EN: *Computational Analysis of Natural Language and Propositional Logic*), at the high school Liceo V. Alfieri, Turin. 70 hours of teaching.
- September 2007* **Lecturer** of the undergraduate course “Laboratori di Informatica” (EN: *Computer Science laboratory*), Faculty of Philosophy, University of Turin, 60 hours of teaching.
- January 2007* **Teaching Assistant** of the undergraduate course of “Informatica” (EN: *Computer Science*), Faculty of Mathematical, Physical, and Natural Sciences, University of Turin, 50 hours of teaching.
- May 2006–2008–2009* **Seminar Lecturer** of OWL and Protégé within the undergraduate course of “Interazione Uomo-Macchina II” (EN: *Human-Computer interaction II*), Faculty of Mathematical, Physical, and Natural Sciences, University of Turin, 21 hours of teaching.