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Organized by
António Branco, Iris Hendrickx,
Sobha Lalitha Devi and Ruslan Mitkov

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Presentation Abstracts

Invited talk: Producing Referring Expressions: Combining Empirical and Computational Approaches to Reference

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ABSTRACT

Referring expressions (including descriptions such as "the man with the hat" and pronouns such as "he") play a central role in communication, and their production has been studied extensively both from an empirical, psycholinguistic and a computational perspective. Psycholinguistic studies of reference production have yielded many interesting ideas (for instance concerning common ground and alignment), but the resulting theories tend to be somewhat sketchy and informal. Computational theories of reference production, on the other hand, often result in explicit and practically useful algorithms, which are unsatisfactory, however, as models of human linguistic behavior. In recent years there has been an increasing interest in trying to bridge the gap between these two approaches. In this talk I will describe a number of recent developments in this area, focussing on two topics in particular. The first concerns the production of referring expressions in interactive settings: I will present new experimental evidence showing that existing algorithms for the production of referring expressions fail to account for how references are produced in interaction. The second concerns overspecification, the phenomenon that referring expressions often include information that listeners do not strictly need for the purpose of identification. In this talk, I discuss recent findings on why speakers produce overspecified descriptions and on how listeners interpret them. Finally, I discuss what a psychologically plausible computational model of reference production might look like.

This work was done within the NWO VICI project "Bridging the hap between psycholinguistcs and computational linguistics: The case of referring expessions" See: http://bridging.uvt.nl/

Multiobjective Simulated Annealing based Approach for Feature Selection in Anaphora Resolution

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ABSTRACT

In this paper we propose a multiobjective simulated annealing based technique for anaphora resolution. There is no generally accepted metric for measuring the performance of anaphora resolution systems, and the existing metrics–MUC, B , CEAF, Blanc, among others–tend to reward significantly different behaviors. Systems optimized according to one metric tend to perform poorly with respect to other ones, making it very difficult to compare anaphora resolution systems, as clearly shown by the results of the SEMEVAL 2010 Task 1 on the Multilingual Coreference Resolution. One solution would be to find a single completely satisfactory metric, but it's not clear whether this is possible and at any rate it is not going to happen any time soon. An alternative is to optimize models according to multiple metrics simultaneously. In this paper, we propose a multiobjective simulated annealing based technique to solve the feature selection problem of anaphora resolution by optimizing multiple objective functions. Experimental results show that the proposed approach performs superior in comparison to the previously developed multiobjective genetic algorithm based feature selection technique

Effects of Reference Form on Frequency of Mention and Rate of Pronominalization

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ABSTRACT

Comprehension studies find that a referent, which is expected to be picked up more often in the subsequent discourse, is also more prone to be realized by means of a more reduced type of referring expression (typically a pronoun), compared to a referent that is less expected to be re-mentioned (Ariel 1988, Arnold 1998). This paper evaluates this assumption and shows that it does not always hold. Specifically, I take a closer look at the effects of choice of indefinite referential form in English and German on likelihood of subsequent mention and likelihood of subsequent pronominalization. The results of two experimental studies suggest that these two factors, which pertain to the upcoming discourse, should be separated, as they point into different directions. While the type of referring expression used to introduce a referent impacts its frequency of subsequent mention, the rate of pronominalization seems to be dependent on other characteristics of the referent.

Leveraging Different Meronym Discovery Methods for Bridging Resolution in French

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ABSTRACT

This paper presents a statistical system for resolving bridging descriptions in French, a language for which current lexical resources have a very low coverage. The system is similar to that developed for English by Poesio et al (2004), but it was enriched to integrate meronymic information extracted automatically from both web queries and raw text using syntactic patterns. Through various experiments on the DEDE corpus, we show that although still mediocre the performance of our system compare favorably to those obtained byPoesio et al (2004) for English. In addition, our evaluation indicates that the different meronym extraction methods have a cumulative effect but that the text pattern-based extraction method is more robust and leads to higher accuracy than the Web-based approach.

Abstract Anaphors in Appositive Relative Clauses in Romanian

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ABSTRACT

The paper represents a contribution to the study of anaphora linked to linguistic structures denoting events, facts or propositions. These anaphors are called abstract anaphors. Abstract anaphors are studied in sentential structures with appositive relative clauses in Romanian. Three abstract anaphors may occur in such sentences: *care* ('which'), *unde* ('where') and *ceea ce* ('which'). It is shown that *care* ('which') is used to denote events and facts (but not propositions); *unde* ('where') may only be used to denote facts, whereas *ceea ce* ('which') denotes facts propositions and outcomes but not events. The analysis therefore documents the existence of finer-grained realizations of abstract anaphora in natural language. At the same time, the analysis enriches the inventory of lexical items which count as a diagnostic for phrases that denote events, facts or intensional objects.

Who are *they*? On the reference of collective *ils* ('*they*') in French

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ABSTRACT

This paper describes the use of collective *ils* (*they*) in regard to the notion of discourse anaphora by examining attested contemporary French data. Collective *ils* designates as set of individuals whose identity remains more or less specified, depending on semantic and contextual factors. On the basis of semantic distinctions proposed in previous work on the subject, this study shows that collective *ils* is related to the notion of *indirect anaphora*, in that the (more or less) identified referent can be inferred from the domain of reference set up by the context. The "collective" nature of the denoted class, as well as its identification, needs to be considered as a gradual property, depending on semantic and contextual recognition from the speaker and the addressee.

Indexicals and the Act of Referring: How Context Constrains and is Modified via Deictic, Anadeictic and Anaphoric References

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ABSTRACT

This paper investigates the constraints that context places on the functioning and interpretation of the use of various indexicals in realising certain context-bound referential procedures, and the effects which that use has on the context it then creates.

   Canonical deixis requires access to the context of utterance, introducing a highly salient discourse-new referent; **discourse deixis** is an instruction to operate upon a representation of the previously constructed discourse, and to create inferentially a partially-new discourse referent from it. **"Recognitional" anadeixis** applies the deictic procedure to a shared memory representation of a past event or situation, turning it from an inactive into an accessible state. **'Strict' anadeixis** presupposes access to a ranked mental representation of potentially competing referents, and makes a non-topical one topical. Finally, **discourse anaphora** requires the discourse representation it accesses to be psychologically salient at the point of use, and signals discourse-unit continuity and integration.

The Choice between Verbal Anaphors in Discourse

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ABSTRACT

This paper investigates the conditions of choice in discourse between various verbal anaphors in English, namely Post-Auxiliary Ellipsis with auxiliary do; do so; and do it/this/that. On the basis of an extensive corpus survey, the following factors are shown to be relevant: (i) register, (ii) the presence or absence of an accessible polar alternative, (iii) whether the sentence containing the

anaphor refers to the same state of affairs as that which contains the antecedent, (iv) the presence of a non contrastive adjunct, (v) the identity of the subject of the anaphor and its antecedent, (vi) the saliency of the antecedent.

Nominal Associative Anaphors – A Text-Based Analysis at the Semantics-Pragmatics Interface

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ABSTRACT

This pilot study investigates the proportion of nominal associative anaphors (NAAs) in German texts. The research is motivated by a study that shows a high proportion of non-possessive uses among two-place predicates (cf. Horn et al. submitted). Such cases could be explained by NAAs, i.e. their anchor may provide the required possessor argument. The question is for how many of the non-possessive uses NAAs account for. Methodologically, we present a preliminary manual for the annotation of NAAs and apply it to a text collection of two text sorts. The results show that a large proportion of non-possessive uses are NAAs. On closer examination not only do we find that the NAA occurrences reflect the distinction between one- and two-place predicates, but also that the distribution of NAAs exhibits differences with respect to their concept types (functional, relational, sortal, individual) proposed in the theory of concept types and determination (cf. Löbner 2011).

On The Interaction Between Semantics and Discourse Coherence Constraints

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ABSTRACT

Based on discourses containing the Russian imperfective, as well as the progressive and perfect in English, I propose that the semantic function of aspectual markers to relate the consequent state of an event (part) in the extension of the verb phrase that they combine with to a salient consequent state of previously mentioned discourse event. This relation, I propose, places constraints on which coherence relation holds between successive utterances and thereby constrains the ordering of events described by these utterances. The proposed analysis differs from the generally held view that among the aspectual markers in natural language, only the perfect makes reference to an event's consequent state.

Perspective in the processing of the Chinese reflexive *ziji*: ERP evidence

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ABSTRACT

We investigated the comprehension of the Chinese reflexive *ziji*, which is typically subject to long-distance binding. However, this preference can be overridden by verb semantics (some verbs require local binding) as well as by subtle feature combinations of interveningnoun phrases (NPs) (e.g., $1^{st}/2^{nd}$ person pronouns block dependencies with more distant 3rd person antecedents). The processing of *ziji* was examined in sentences containing two verb types (local/self-oriented, distant/other-oriented) and three different intervening NPs (1st, 2nd, 3rd person). The event-related potential data revealed an early interaction of verb and intervener: other-oriented verbs showed more processing effort for 1st and 2nd person interveners (blocking), while self-oriented verbs showed a disadvantage for 2nd person (associated with directive speech acts). We argue that two distinct animacy hierarchies are the source for these early verb-specific patterns. The blocking effect showed an additional later effect independent of verb semantics.

Semantic and Structural Constraints on the Resolution of Ambiguous Personal Pronouns–A Psycholinguistic Study

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ABSTRACT

We present a series of on- and off-line experiments to investigate the influence of semantic and structural constraints on the resolution of subject pronouns in German, thereby revealing inconsistencies of previous studies. On the basis of factors like (in-)animacy, the presence/absence of different types of connectors and clausal structure (coordination versus subordination) we show in which way structural and semantic information interact in inter- and intra-sentential anaphor resolution.

Taking a Look Beneath The Surface: Effects of Processing Depth on Pronoun Interpretation

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ABSTRACT

We conducted a self-paced reading study to investigate how processing depth influences pronoun interpretation. We manipulated processing depth by asking readers to answer different kinds of comprehension questions after the critical sentences: Shallow questions could be answered without interpreting the pronoun whereas deep questions probed the referent of the pronoun. Thus, participants in the shallow question group 'learned' that a superficial reading of the sentence is enough to answer the question, whereas participants in the deep group 'learned' that they needed to process the sentences – and the pronouns – more completely. Participants'

reading time patterns suggest that under shallow processing, pronoun interpretation is not automatic, even with unambiguous pronouns. Under deep processing, reading time patterns suggest that comprehenders used both gender-marking and probabilistic higher-level inferences to infer pronoun antecedents in real-time. As a whole, our findings suggest that processing-depth modulations impact both categorical cues and probabilistic, non-local cues.

Querying and Visualizing Coreference Annotation in Multi-Layer Corpora

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ABSTRACT

This paper describes the application of the linguistic information system ANNIS to the querying and evaluation of corpora with coreference and multiple other layers of hierarchical and relational annotation.

ANNIS provides a web-based graphical user interface that allows linguists to run queries against corpora in a data base and to display their results in a convenient way, without the necessity to become experts in any specific programming language. It is based on a generic data model that is capable to represent any kind of linguistic annotation. To our best knowledge, ANNIS is the *first and only* corpus query system that allows to formulate queries across an unrestricted combination of relational and hierarchical annotations.

This is illustrated here for a multi-layer corpus of German newspaper commentaries, the Potsdam Commentary Corpus, with corpus queries that address three independent layers of annotation, constituent syntax, coreference, and annotations for discourse structure.

A Framework for Reference Resolution Exploiting the Givenness Hierarchy and Semantic Roles

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ABSTRACT

This paper presents a conceptual reference resolution framework using human-like language processes to resolve references for the pronoun *it*. The pipelined framework includes five components that each performs an aspect of the reference resolution process. First, the Givenness Hierarchy is used to create an initial set of prospective antecedents. Binding theory, number and gender, and a semantic component that performs semantic reasoning by integrating information from VerbNet, Propbank, and WordNet is used to prune the set. The last component uses a preference-based algorithm to select a best guess if the other components were unable to prune the set to a single prospective antecedent.

The accuracy rate of the system was 88.80% when all referential instances of *it* along with four cataphoric instances of *it* and one non-referential instance that could not be computationally excluded were processed. If the cataphoric instances and non-referential instance were excluded, the accuracy rate was 90.61%.

Rule-Based Coreference Resolution Module for Polish

Maciej Ogrodniczuk and Mateusz Kopeć

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ABSTRACT

This paper presents the results of the first attempt of coreference resolution for Polish running on true mention boundaries and using a few rich rules, corresponding to syntactic constraints (elimination of nested nominal groups), syntactic filters (elimination of syntactic incompatible heads), semantic filters (wordnet-derived compatibility) and selection (weighted scoring). The results are compared to human annotation and presented in four sets: with two common baselines: all-singletons/head-match, and two slightly more complex settings with four and five rules.

Resolution of Anaphoric and Exophoric Definite Referring Expressions in a Situated Language Environment

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ABSTRACT

In order for reference resolution algorithms to prove effective in situated language environments, methods are required that take into account the situational context as well as the discourse context. Situated language contexts introduce a range of factors not present in text-based discourse. These factors are not well understood. Questions that arise include: what are these factors and how do they affect reference resolution? This paper presents a reference resolution algorithm for a situated 3D environment that utilises the theory of the Givenness Hierarchy and combines salience factors from the discourse, visual scene and the task. The algorithm has procedures for a range of definite referring expressions; this paper focuses on expressions formed using the definite article. The algorithm was tested in a set of 22 human-computer collaborative task experiments in a 3D environment. The algorithm achieved an accuracy of 92%.

Protagonism as a Factor Affecting Referential Choice in Discourse

Anastasia Linnik and Grigoriy Dobrov

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ABSTRACT

This paper presents an investigation of a referent's centrality in discourse, or 'protagonism', as a factor affecting referential choice. We introduce statistical methods of protagonist definition and substantiate them with the help of an experiment with native speakers. By using statistic modeling and by implementation of protagonism into a *multifactorial model of referential choice* we demonstrated on the data of the RefRhet corpus that the referent's protagonism increases the accuracy of the referential choice prediction.

Exploring the Lexical and Acoustic Consequences of Referential Predictability

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ABSTRACT

Findings from various domains suggest that predictability is an important component of language processing. We report psycholinguistic research suggesting that predictability also influences referential processing, in the form of reduced acoustic durations for predictable referents. However, we do not find evidence that predictability directly influences likelihood of pronominalization, contrary to some prior claims. Instead, our data indicate that the use and interpretation of pronouns is influenced by thematic role, independently of which referent is most predictable, i.e., most likely to be mentioned next. We suggest that likelihood-of-mention is influenced by the mapping between syntactic and thematic roles. Our results highlight the benefits of exploring both lexical and acoustic aspects of referential production.

The Cataphoric Potential of Indefinites in German

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ABSTRACT

Not only do indefinite noun phrases introduce new discourse referents, they also equip them with a cataphoric (or forward-looking) potential, i.e. with a certain degree of activation which is mirrored in discourse effects such as the frequency of anaphoric references back to the referent in the subsequent discourse. Comparing the two German indefinite determiners *ein* 'a(n)' and indefinite demonstrative*dieser* 'this', we claim that the degree of the cataphoric potential of an indefinite noun phrase (i) correlates with specificity and (ii) a second parameter independent of specificity.

Reaction Time Data Reveal Variation in Reference Assignment Processes in Germanic Languages

Esther Ruigendijk and Petra Schumacher

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ABSTRACT

Referential dependencies for pronouns and reflexives can be established at different linguistic levels. According to Reuland (Reuland, 2001), syntactic dependencies are 'cheaper' than semantic dependencies, which are 'cheaper' than discourse dependencies. Psycholinguistic research on English and Dutch show that interpretation of reflexives for which discourse operations are needed (i.e. in locative PPs) is computationally more costly than the interpretation of coargument reflexives based on syntactic dependencies only. Similarly, semantic bound variable interpretation (BV) has been shown to be 'cheaper' than discourse-based coreference interpretation. This study investigates these dependencies in German and replicates the finding that semantic BV interpretation is 'cheaper' than discourse-based coreference interpretation. As expected however,

no difference was found for the reflexives, supporting the idea that reflexives in prepositional phrases in German depend on the same interpretive mechanisms as coargument reflexives, indicating that the underlying syntactic configuration differs from that in other Germanic languages.

Analysis and Reference Resolution of Bridge Anaphora across Different Text Genres

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ABSTRACT

We discuss bridge relations in Dutch between two textual referents across six different text genres. After briefly presenting the annotation guidelines and inter-annotation agreement results, we conduct an in-depth manual analysis of the different types of bridge relations found in our data sets. This analysis reveals that for all genres bridging references stand mostly in a class relationship, which is exactly the kind of information represented in a WordNet hierarchy. This inspired us to investigate to what extent a standard coreference resolution system for Dutch is capable of resolving bridge relations across different text genres and study the effect of adding semantic features encoding WordNet information. Our results reveal modest improvements when using Dutch WordNet LCS information for all but one genre.

NADA: A Robust System for Non-Referential Pronoun Detection

Shane Bergsma and David Yarowsky

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ABSTRACT

We present NADA: the Non-Anaphoric Detection Algorithm. NADA is a novel, publicly-available program that accurately distinguishes between the referential and non-referential pronoun *it* in raw English text. Like recent state-of-the-art approaches, NADA uses very large-scale web N-gram features, but NADA makes these features practical by compressing the N-gram counts so they can fit into computer memory. NADA therefore operates as a fast, stand-alone system. NADA also improves over previous web-scale systems by considering the entire sentence, rather than narrow context windows, via long-distance lexical features. NADA very substantially outperforms other state-of-the-art systems in non-referential detection accuracy.

Resolving Noun Phrase Coreference in Czech

Michal Novák and Zdeněk Žabokrtský

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ABSTRACT

In this work, we present first results on noun phrase coreference resolution on Czech data. As the data resource for our experiments, we employed yet unfinished and unpublished extension of Prague Dependency Treebank 2.0, which captures noun phrase coreference and bridging relations. Incompleteness of the data influenced one of our motivations – to aid annotators with automatic pre-annotation of the data. Although we introduced several novel tree features and tried different machine learning approaches, results on a growing amount of data shows that the selected feature set and learning methods are not able to sufficiently exploit the data.

Clitics in Spanish Agrammatic aphasia. A Study of the Production of Unaccusative, Reflexive and Object Clitics

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ABSTRACT

Cross-linguistic research on language pathologies has shown that production of clitic pronominals is problematic for patients with aphasia. The current contribution provides the first data on production of the unaccusative/middle clitic SE and considers how pronominal interpretation influences verb production. Two morphologically similar constructions are studied: unaccusative and refexive sentences. Results are compared with production of direct object clitics. The data show that transitive sentences with DO clitics are harder to produce than unaccusative, reflexive and transitive (will full DPs in object position) constructions. These findings are explained by the increase difficulty that processing of DO clitics involves: discourse linking and clitic placement. Finally, reflexive verbs were not more difficult to produce than transitive sentences. The current study therefore supports the analysis of reflexives as structurally similar to unergative entries.

Inter- and Intra-Clausal Pronoun Resolution

Jeffrey Runner and Elsi Kaiser

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ABSTRACT

The factors that influence cross-clausal pronoun resolution have been the subject of much fruitful research. Aside from work examining syntactic binding constraints, much less research has examined the factors influencing ambiguous pronoun interpretation within a single clause. The goal of this paper is to begin to relate factors influencing the interpretation of pronouns within a clause to factors known to affect cross-clausal pronoun resolution.

The Discourse Structuring Potential of Definite Noun Phrases in Natural Discourse

Sofiana Chiriacescu and Klaus von Heusinger

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ABSTRACT

This paper investigates an alternation found with definite noun phrases in direct object position in Romanian that represents a theoretical puzzle for current theories of Differential Object Marking or *pe*-marking. When in direct object position and unmodified, definite noun phrases can be accompanied either by the differential object marker *pe*, or by the simple enclitic definite article. In light of the findings of a sentence-continuation experiment, we show that *pe*-marking is used for referents that display a high Discourse Structuring Potential . We conclude that different types of definite noun phrases do not equally contribute to the Discourse Structuring Potential of their referents. We argue that *pe*-marked unmodified definite noun phrases display (i) a higher likelihood of subsequent mention and (ii) a higher topic shift potential.

Can Projected Chains in Parallel Corpora help Coreference Resolution?

José Guilherme Camargo de Souza and Constantin Orasan

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ABSTRACT

The majority of current coreference resolution systems rely on annotated corpora to train classifiers for this task. However, this is possible only for language for which annotated corpora are available. This paper presents a system that automatically extracts coreference chains from texts in Portuguese without the need to have Portuguese corpora which were manually annotated with coreferential information. To achieve this, an English coreference resolver is run on the English part of an English-Portuguese parallel corpus. The coreference pairs identified by the resolver are projected to the Portuguese part of the corpus using automatic word alignment. These projected pairs are then used to train the coreference resolver for Portuguese. Evaluation of the system reveals that it does not outperform a head match baseline. This is due to the fact that most of the projected pairs have the same head, which is learnt by the Portuguese classifier. This suggests that a more accurate English coreference resolver is necessary. A better projection algorithm is also likely to improve the performance of the system.

Improving Relation Extraction with Anaphora in Italian

Fabio Celli and Massimo Poesio

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ABSTRACT

Semantic Relation Extraction is the task of retrieving information about entities and Anaphora Resolution is the task of linking expressions referring to entities in text. In this paper we use Anaphora Resolution to increase the number of information about entities in order to improve the performance of Semantic Relation Extraction in Italian. We developed three relation extraction systems, based on three different extraction techniques, and we run our systems on the dataset, first without using the Anaphora Resolution system and then using it. Results show that there is a qualitative and quantitiative improvement of the relations extracted.

Resolution of Pronominal Anaphors using Linear and Tree CRFs

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ABSTRACT

Pronominal resolution is the task of identifying the referent of a pronoun, the antecedent. It is one of the important and challenging tasks in NLP. Traditional approaches consider the problem as a pair-wise classification problem, if given a pronoun, local classification decisions are made for each word to decide whether it is an antecedent or not, independent of the other words. However this independent assumption does not always hold on real data. In this paper we discuss about a new approach using markov random fields in identifying the antecedent of a pronoun. The linear-chain CRFs, which is very commonly used are not optimal for this task, since long distance anaphor –antecedent relation cannot be captured. We prepare tree CRFs for this task, and derive the graph structure from the parse tree. We use the Ontonotes trees for this task which was released for CoNLL shared task and find that the tree CRFs outperformed the Linear-chain CRFs.

Anaphora and Gestures in Multimodal Communication

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ABSTRACT

This paper describes a pilot study of gestures which are connected to anaphoric expressions and to their antecedents in video-recordings of spontaneous two- and three party interactions. The recordings have been transcribed, multimodally annotated and analysed. The results of this analysis and of machine learning experiments run on these data show that gestures which are related to anaphora (or to co-referring expressions) and their antecedents have many common attributes describing their shape. They also show that shape attributes can be used for automatically identify gestures connected to referring expressions. These results are promising for both anaphora resolution and for the generation of plausible conversational agents.

Coreference and Anaphoric Annotations for Spontaneous Speech Corpora In French

Emmanuel Schang, Aurore Boyer, Judith Muzerelle , Jean-Yves Antoine , Iris Eshkol and Denis Maurel

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ABSTRACT

This paper presents a corpus-based analysis of coreference and anaphoric relations in French spontaneous conversational speech. It presents the annotation task and two experiments on this corpus (gender and number agreement, definite descriptions as first mention of new discourse entities) which aim at assessing the relevancy of current anaphora solvers on spontaneous speech.

Abstract Anaphors in German and English

Stefanie Dipper, Christine Rieger, Melanie Seiss and Heike Zinsmeister

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ABSTRACT

Abstract anaphors refer to abstract referents such as facts or events. Automatic resolution of this kind of anaphora still poses a problem for language processing systems. The present paper presents a corpus-based comparative study on English and German abstract anaphors and their antecedents to gain further insights into the linguistic properties of different anaphor types and their distributions. To this end, parallel texts from the Europarl corpus have been annotated with functional and morpho-syntactic information. We outline the annotation process and show how we start out with a small set of well-defined markables in German. We successively expand this set in a cross-linguistic bootstrapping approach by collecting translation equivalents from English and using them to track down further forms of German anaphors, and, in the next turn, in English, etc.

Invited talk: Pronominal Resolution, Dependencies and the Architecture of the Linguistic Brain

Maria Mercedes Piñango

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ABSTRACT

The literature on Broca's aphasia comprehension (where Broca's aphasia is understood as the syndrome resulting from lesion to left inferior frontal cortex (BA 44/45/6 and underlying white matter)) reveals an interesting situation: on the one hand, it reports a robust pattern of impairment in the comprehension of pronouns (vs. reflexives) and in the comprehension of object relative clauses and agentive passives (vs. subject relative clauses and actives) thus suggesting that these two kinds of phenomena share common linguistic mechanisms, and on the other, it does not offer a unified account for the patterns observed. That is, the independent generalizations proposed to account for each of these patterns are not necessarily compatible with each other. This situation can be explained in at least two ways: either binding phenomena and relative clauses rely on categorically distinct mechanisms (and therefore it is simple coincidence that they both be affected by damage to the same brain region) or the generalizations proposed to capture the two contrasts are not formulated at the right level of resolution.

This talk is an exploration of the second possibility. To this end I bring together lesion and imaging-based evidence on pronoun comprehension and compare the patterns observed to those associated with Wh-dependencies. I focus on recent fMRI findings from our lab which show a distinction between /phrase structure/ relations that syntactically support the dependencies (exclusively recruiting cortical regions BA44/6) and the /semantic relations/ involved in the dependencies (exclusively recruiting BA45/47). Those results show that just like pronominal interpretation, which has been viewed as the result of the interaction between coindexation (syntactic) and coreference (semantic) mechanisms, Wh-dependencies result from the interaction of phrase-structure building (syntactic) and argument interpretation (semantic) mechanisms. Crucially, these functional distinctions observed are found a) within the confines of Broca's area and b) as the comprehension of the sentence unfolds, suggesting not the activity of isolated cortical regions but of cortical paths.

The discussion will center on the possible organizing principles of the linguistic architecture that these findings suggest, and of the cortical paths hypothesized to support it. It will also explore the notion that linguistic organization as we currently understand it may not be in a one-to-one correspondence with brain organization. That instead the brain organizes language in ways that cut across traditional subcomponents of the system.

Tutorial BART Multilingual Anaphora Resolution System

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ABSTRACT

BART is an open-source modular toolkit for anaphora resolution that supports state-of-the-art statistical approaches to the task and enables efficient feature engineering. It implements different models of anaphora resolution (mention-pair and entity-mention; best-first vs. ranking), has interfaces to different machine learners (MaxEnt, SVM, decision trees) and provides a large set of linguistically motivated features, along with the possibility to design new ones. BART has originally been created and tested for English, but its flexible modular architecture ensures its portability to other languages and domains.

At the last CoNLL competition for Coreference Resolution in English, two groups submitted systems based on BART, both scoring among the top teams. BART has also shown reliable performance for German, English and Italian at the Semeval-2010 task 1 on Multiligual Coreference Resolution.

The aim of this tutorial is to make the anaphora resolution community more familiar with BART, providing information on the basics (installation, running as a "black box") and more advanced usage (implementing your features and models) usage. We believe that this tutorial will be appealing for linguists interested in anaphora resolution but not willing to implement a state-of-the-art full-scale system from scratch, as well as researchers developing new coreference resolution algorithms and using coreference in their applications.

Outline:

1. Installing BART, making your first experiments

2. Runnng BART with different input/output format. CoNLL format and scoring.

3. Running BART as a black box (for using in an external application)

4. Fine tuning BART: different models, feature selection, machine learners

5. LanguagePlugin: porting BART to new languages

6. Developing new features or models.