

# **Book of Abstracts**

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SFB 732: *Incremental Specification in Context*  
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## Cross-corpus experiments on emotional datasets

Laura Ana Maria **Bostan** (SEAT)

[Poster]

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The overarching goal of this project is to develop methods to extract structured and relational information in the context of emotion mentions. The current state of the art in emotion analysis focuses on *trigger* detection and on mapping trigger phrases and words into a psychological model. We are interested in extracting also the *experiencer* of an emotion, the *cause*, and the *reaction* to the emotion if it exists. As a first step into understanding the literature in the field of emotion analysis we looked at existing datasets that have been annotated and published for classification of emotions following different annotation schemes motivated by different psychological emotion theories. These include discrete sets of different sizes (e. g. *joy*, *sadness*, *fear*, *anger*, *disgust*, *surprise*) and continuous values for *dominance*, *arousal* and *valency*. Predictive models building on top of such existing corpora often only focus on a limited set of available resources due to the tedious necessary data conversion or to the differences in annotation scheme. No previous work compared emotion corpora in a systematic manner so we contributed to this situation with an analysis of the datasets and we publish them in a common file format. This included mapping different annotation schemes. In addition, we performed cross-corpus classification experiments to gain insight and a better understanding of differences of models inferred from the data. We are currently working on developing an improved understanding of the impact of complex phrasal constructions and on morphological variations on the emotional connotation of specific words. The next steps include annotating existing corpora with appropriate structure information of emotions. Based on these resources, we will develop models which automatically extract such structures.

## Lexical Substitution for Evaluating Compositional Distributional Models

Maja **Buljan** (D10)

[Poster]

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Compositional Distributional Semantic Models (CDSMs) model the meaning of phrases and sentences in vector space. They have been predominantly evaluated on limited, artificial tasks such as semantic sentence similarity on hand-constructed datasets. In our work, we argue for lexical substitution as a means to evaluate CDSMs. Lexical substitution is a more natural task, enables us to evaluate meaning composition at the level of individual words, and provides a common ground to compare CDSMs with dedicated lexical substitution models. We create two lexical substitution datasets for CDSM evaluation from an English-language corpus with manual “all-words” lexical substitution annotation. Our experiments indicate that the Practical Lexical Function CDSM outperforms simple component-wise CDSMs and performs on par with the context2vec lexical substitution model using the same context.

## **An experimental investigation of exhaustivity and its trigger in Mandarin focus constructions**

Jun **Chen** (no association to a project)

[Poster]

Project: Work on exhaustiveness effects carried out at the Institute for German Linguistics

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As in English, Mandarin Chinese expresses focus via *only*-sentences (e.g. Only [John]<sub>Foc</sub> ate the cake), sentences with focus accent/stress assigned (e.g. [John]<sub>stress</sub> ate the cake), or copular sentences (e.g. It is John that ate the cake). Among the central questions of focus semantics is to what extent a focus sentence encodes exhaustivity (stating that JOHN satisfies the property of cake eating and simultaneously excluding all other individuals). Existing experimental paradigms have sought to establish the strength/extent of exhaustivity by comparing how strongly participants reject a sentence in contexts that overtly contradict an exhaustive scenario. A further complication in Mandarin Chinese involves the presence of a *de*-particle in copular sentences, which has been informally suggested to generate an exhaustive inference. The current study designs one main task, i.e., self-paced reading task, and potentially an additional task, which is the cover-box pictorial comprehension task, to examine the strength of exhaustive inference across Chinese focus construction types. Particular attention is paid to a contrast between the copular sentence type with the *de*-particle and a minimally different construction type without the particle. The experiments intend to shed light upon what part of the grammar should one assign to the exhaustive inference in Chinese, and upon the meaning contribution of the controversial *de*-particle.

## **Ensemble systems for mono- and multilingual dependency parsing**

Agnieszka **Faleńska** (D8)

[Progress Report]

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Ensemble systems can achieve higher performance than single models. However, while designing such systems many decisions have to be made: what architectures of single models to use, how to combine outputs of different models, or how to weight them. This talk will focus on methodological aspects of ensemble systems for dependency parsing. I will present two scenarios: mono-lingual parsing, in which models with different architectures are combined to improve the overall performance, and multi-lingual parsing, where combining models trained on different languages helps to overcome the data sparsity problem. Finally, I will present the third use case of ensemble systems – domain adaptation with small supervision – which will be the focus of my future work.

## **Making the Useful Usable – On Aspects of Usability**

Markus **Gärtner** (INF)

[Poster]

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Among the many resources (corpora, lexicons, tools or others) we see emerging in the field of natural language processing every day, only very few actually manage to achieve a sufficiently high level of usability. Common issues include the lack of either documentation (equally important for all resources) or interoperability (especially relevant for any kind of actual NLP application), or even both. As a result, the effort (or cost) required from potential users to make themselves

familiar enough to be able to use a resource can easily prove prohibitive, as can the overall incompatibility with a particular resource. Due to the missing gratification of effort spent on solutions for those issues, such as proper documentation of the creation process of a resource, incentive on the side of creators or developers is comparatively low. In my work I'm exploring ways to tackle these problems from different perspectives: One of those includes conceptually shifting the aspect of interoperability between processing tools from the (physical) representation layer into the (in-memory) software layer. This is exemplified by a middleware system for corpus modeling in the Java programming language. Another one is related to ensuring exhaustive process documentation with minimal effort already during an active research workflow. Due to time and space constraints I will focus on the first one on my poster.

### **Cognitively-Motivated Natural Language Generation**

*Glorianna Jagfeld* (no association to a project)

[Poster]

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We present a comparison of word-based and character-based sequence-to-sequence models for data-to-text natural language generation, which generates natural language descriptions for structured data such as tables. On two datasets, our models demonstrate their effectiveness in generating meaningful texts. However, if the objective is the generalizability of the models in terms of both their input and output, they show their limitations, memorizing training examples in many cases. We argue that the main issue could be the restriction of the structured input which limits the potential of such models.

Hence, the next phase of the PhD project will explore natural language generation in the context of machine question answering where the conditioned inputs are also natural language. We will investigate human strategies in different question answering scenarios. These insights will inform the design of cognitively motivated systems to achieve better performance and higher robustness against adversarial attacks. Natural language generation could come into play here also for answer explanation, leading to more interpretable systems.

### **Encoding third person perspective in Jula: forms, context and interpretation**

*Alassane Kiemtoré* (no association to a project)

[Poster]

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As it has long been recognized in the literature, some referential dependencies associated with nominal anaphora involve the notion of perspective, hence perspectivization (Clements 1975, Sells 1987, Kuno 1987, among others). Within the scope of my PhD-thesis I investigate a special type of referential dependency along with mental perspective (logophoricity) in the West-African Mande language Jula. The poster provides an overview of the main questions relating to the topic of research and presents some findings from the language of investigation. Crucially, I discuss aspects concerning the linguistic encoding of mental perspective in Jula (form and contexts) and the nature of the referential dependency it involves (interpretation).

## **Everything is Connected: An Interplay of Characters, Emotions, and Literary Genres**

*Evgeny Kim* (CRETA/SEAT)

[Poster]

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In my poster, I will give an outline of my previous work that focused on tracking emotions in different literary genres and the interaction of characters in the fictional texts. The poster will highlight some limitations of existing approaches to characterize emotions in literature and will set a ground for a finer-grain computational analysis of emotions in fictional texts that focuses on characters and their emotional relationship.

## **Modeling and Understanding Derivational Morphology Using Distributional Semantics**

*Max Kisselew* (B9)

[Dry Run]

Project: SFB 732, B9 "Distributional Characterization of Derivation"

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The goal of my PhD project was to investigate how distributional semantics can contribute to our understanding of derivational morphology. In the first part of my talk I will present the results of several studies I conducted over the last years which aimed at investigating how derived word forms can be predicted from their base forms using methods from compositional distributional semantics in a multilingual setting. In the second part of my talk I will discuss several case studies which demonstrate how these methods can contribute to a better understanding of linguistic properties of derivational morphology.

## **Computational approaches for German particle verbs: compositionality, sense discrimination and non-literal language**

*Maximilian Koeper* (D12)

[Dry Run]

Project: SFB 732, D12 "Sense Discrimination and Regular Meaning Shifts of German Particle Verbs"

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When you work four years on German Particle Verbs (PV) you constantly think about giving up. Such expressions (giving up - German: aufgeben/aufhören) are ambiguous, opaque, syntactically separable and therefore "A Pain in the Neck for NLP" (Sag et al. (2002)). In this talk I will give an overview of our past and most recent work on German PVs. We focus on computational approaches to model compositionality, senses and non-literal language. The talk starts with the PV 'anfangen' (to start) and ends with 'aufhören' (to end). The talk will cover all time favorite examples from past KWT retreats, including 'aufbrummen', 'aufdonnern' and very likely: 'abschminken'.

## **Teaching Computers Empathy: CNN-based Speech Emotion Recognition in Spoken Dialog Systems**

*Michael Neumann* (A8)

[Progress Report]

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Speech emotion recognition is a research field in the realm of paralinguistics, which is concerned with detecting the affective state of a speaker. Besides gaining theoretical insights about emotions

in speech, a practical motivation for this research is to enhance speech-based human-machine-interaction by incorporating emotions as they are an important part of human communication. In my PhD project I mainly focus on these two research questions:

- a) Is language-independent speech emotion recognition possible?
- b) How can speech emotion recognition be integrated in an adaptive spoken dialog system to enhance usability and user acceptance?

In this talk I provide some theoretical background on how emotions can be categorized, followed by a broad overview of my work. Two aspects of my recent work will be presented in more detail: cross-lingual and multilingual automatic speech emotion recognition, and a study about cross-lingual human perception of emotions from speech. I conclude the talk with some thoughts on possible problems and limitations and a summary of the next steps to take.

### **Distinguishing Antonymy, Synonymy and Hypernymy with Distributional and Distributed Vector Representations and Neural Networks**

*Kim-Anh Nguyen* (D12)

[Dry Run]

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In the last decade, computational models that distinguish semantic relations are crucial for many applications in Natural Language Processing. These computational models typically distinguish semantic relations by either representing words as vector representations in the vector space, or using neural networks. In this talk, we present approaches to improve both word vector representations and neural networks for distinguishing antonymy, synonymy, and hypernymy. Moreover, we also verify these computational models with Vietnamese which is a low-resource language and lacks gold standard resources for evaluating semantic similarity and relatedness.

### **Densely Connected Convolutional Networks for Continuous Speech Recognition**

*Chia-Yu Li* (A8)

[poster]

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This poster presents our latest investigation on Densely Connected Convolutional Networks (DenseNets) for acoustic modelling in Automatic Speech Recognition. DenseNets are very deep, compact convolutional neural networks, which have demonstrated incredible improvements over the state-of-the-art results on several data sets in Computer Vision. Our experimental results show that the DenseNet architecture improved other neural-based models without using speaker adaptive features on Resource Management and Wall Street Journal Corpus.

## PhD Research: Neural-based End-to-end Spoken Dialog Systems

Daniel **Ortega** (A8-N)

[Poster]

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The main goal of my PhD studies is to design modular spoken dialog systems that can efficiently treat human language ambiguity and uncertainty, and are able to generate natural and informative responses in order to achieve user goals. The approaches are mainly based on deep learning techniques to deal with uncertainty across the entire system and reinforcement learning to control the course of the dialogs covering unseen cases during training. During the first year of my PhD, the research was mainly focused on building models for the Intent Network, whose goal is to determine the intent of the user at every utterance in the dialog, exploiting both lexical and acoustic features by means of neural techniques.

## Exploring Structural Similarities for Multiple Corpora in the Digital Humanities

Janis **Pagel** (QuaDramA)

[Poster]

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As I am at the beginning of my PhD studies, I will give an outlook on possible directions of my dissertation. In the center of my research, I will put the investigation of different text domains coming from the digital humanities. Starting from dramatic texts, I will investigate a core computational linguistic task, (co)-reference resolution, and the necessary preceding tasks, such as part-of-speech tagging and constituency parsing. In a second step, I will compare my findings for dramatic texts with other similarly structured types of text, such as movie scripts, using the experiences that were gained on the dramatic texts. The third step and final objective will be to develop a best practice framework for generating or choosing training data for new corpora with the aim to perform (co)-reference resolution, on the basis of interpretable and generally discoverable linguistic text properties. This best practice framework would fulfill two goals: Gaining new insights into the critical task of choosing training data for non-standard domains and putting the insights about structural similarities to test.

## Who Said That? – Machine Learning for Quotation Analysis

Sean **Papay** (Quote)

[Poster]

Project: Quote

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Who’s talking? What are they saying? To whom? These are the questions I seek to answer in my dissertation work on quotation analysis and attribution. My tasks focus on quotation analysis, attribution, and addressee detection within fiction text. These tasks will be carried out using a wide range of machine learning techniques, with a focus on deep learning, joint learning, and structured prediction.

In this poster, I will give particular focus to DeRE, a relation- extraction framework I am helping to develop, which will be used to implement the machine learning models for my work. In addition, I will discuss the data that will be needed for training these models, and how I will be generating new data via crowdsourced annotations.

## **New Ideas and Resources for Semantic Parser Induction**

Kyle **Richardson** (D2)

[Dry Run]

Project: SFB 732, D2 “Combining Contextual Information Sources for Disambiguation in Parsing and Choice in Generation”

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In this talk, I will give an overview of my PhD project on semantic parser induction and natural language understanding. The main topic, semantic parser induction, relates to the problem of learning to map input text to full meaning representations from parallel datasets. Such resulting “semantic parsers” are often a core component in various downstream natural language understanding applications, including automated question-answering and generation systems. We look at learning within several novel domains and datasets (e.g., software documentation for text-to-code translation) and under various types of data supervision (e.g., learning from entailment, “polyglot” modeling, or learning from multiple datasets).

## **Coreference and bridging resolution: an overview of my PhD work**

Ina **Rösiger** (A6, Creta)

[Dry Run]

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In this talk, I will give an overview of my work on coreference and bridging resolution, focusing on (i) the annotated data which we have created, (ii) tools which were developed on the basis of these data, and (iii) research questions that we investigated using the newly developed tools and data. Besides the general overview, the talk will also cover recent experiments on bridging resolution, which revealed the need for a clearer task definition as well as some fundamental problems in existing bridging annotation, and the collaboration with Maximilian Köper, Kim-Anh Ngyuen and Sabine Schulte im Walde on integrating predictions from neural-net relation classifiers into coreference and bridging resolution.

## **The influence of rhythmic preferences on the prosodic marking of information structure in German, English and German learners of English**

Nadja **Schauffler** (A7)

[Poster]

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In German and English, information structural categories are typically marked by pitch accent placement and pitch accent type. However, the actual choice of pitch accent type as well as the distribution of pitch accents can vary beyond of what semantic or pragmatic factors can explain. Since both languages also share a preference for rhythmic alternation (i.e. an alternation of strong and weak), I investigate how this preference interacts with the prosodic marking of contrastive focus, and how the rhythm vs. focus-marking conflict is handled by German learners of English. In a second study, I investigate how Stress Shift interacts with contrastive focus marking in Rhythm Rule contexts in English L1 and L2.



## Distributional Models of Lexical Semantic Change

*Dominik Schlechtweg* (D12)

[Poster]

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The thesis aims to examine the potential of automatic distributional methods for measuring and detecting Lexical Semantic Change (LSC) in diachronic text corpora. In the thesis, an evaluation task will be introduced, resources for various phenomena of LSC will be created and used to compare different models. Recent advances in the field of LSC modeling provide a wealth of algorithms for which a systematic comparison is however still missing, primarily because of the lack of resources for evaluation. We will present a recent study in which we counteract this lack of resources by proposing an annotation framework for LSC. Moreover, we will introduce a precise task definition for the evaluation of computational LSC models within which we are also able to define the notion of a word’s *degree* of LSC in a corpus. From these definitions follows a range of new possibilities to obtain training and testing data.

## Cross-lingual paraphrases and frame semantics

*Jennifer Sikos* (Cision-Insights)

[Poster]

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Frame semantics is a theory of predicate-argument structure, and it is a promising descriptive framework for representing multilingual semantic structures. Interest in cross-lingual frame semantics has produced the multilingual FrameNet project, where frame-semantic resources have emerged in multiple languages across the world. In the process of constructing these multilingual FrameNets, however, many teams have described challenges in applying the English version directly to data in their target languages. Since frames emerge from lexicalization patterns and shared syntactic constructions, divergences in language-specific structures are reflected in the definitions of the frames themselves. Although some frames might be successfully transferred across certain language pairs, several will fail to translate in multilingual corpora. My project explores when this non-parallelism appears in cross-lingual data and tests whether exploration into paraphrase detection is a necessary step towards capturing variations in frame behavior in naturally-occurring, multilingual text.

## The special status of experiencer object verbs

*Anne Temme* (B6)

[Poster]

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Linguistic research deals with psych verbs either as the phenomenon under investigation or makes use of their exceptional properties to gain insight into different linguistic levels and their interfaces in theoretical as well as experimental work. My thesis takes the former perspective and investigates the nature of experiencer object verbs in order to learn more about specific properties and features they potentially share with other predicates. Three major issues will be addressed: the confirmation of psych properties in German, the semantic characterization of experiencer object verbs and their isolation from non-psych verbs.

## **Approximate Dynamic Oracle for Dependency Parsing with Reinforcement Learning**

*Xiang Yu* (D8)

[Poster]

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We present a general approach to approximate dynamic oracles with reinforcement learning on transition systems where perfect dynamic oracles are difficult to design or inefficient to apply. We treat the transition system as the environment, design the reward function inspired by the classical dynamic oracle, and use Deep Q-Learning (DQN) techniques to train the oracle with gold-standard trees as features. The combination of a priori knowledge and empirical methods enables an efficient and accurate dynamic oracle, which improves the parser performance in several transition systems.