I. Introduction/ Motivation

- **Word Sense Disambiguation:**
  - Distinguishing between the meanings of words in context.
  - Used in many NLP applications (i.e., Machine translation, Q&A systems etc.).
- The problem: common WSD algorithms only produce satisfying results when used on the same domain they are trained on.

**Goal:** develop a WSD system with included domain adaptation.

**Two approaches (Figure 1):**
1. Supervised, via machine learning, the main approach.
2. Unsupervised, via a graph structure from the UKB tool, to evaluate our results against.

- The disambiguation task concentrated on nouns, verbs, and adjectives.
- We used the coarse-grained WordNet SuperSenses classes (Figure 2).
- Testing was done on three domains: the SemCor Corpus as base corpus, a collection of ritual texts and recipes.
- The disambiguation process is preceded by a preprocessing step to prepare the input texts for the algorithm.

II. The supervised approach

- **General info:**
  - System „learns” to correctly label of senses by manually annotated data (from both source and target domains).
  - Extracting of relevant features.
- **Used training data:**
  - Source domain (huge data amount): SemCor corpus (~200,000 annotated words).
  - Target domains (little data amount): self-annotated data for both domains (~130 sentences each).
- **Features (Figure 3):**
  - No syntactic features due to sentence structur of target domains (no parser applicable).
  - Avoidance of too many features (feature overfitting).

III. The unsupervised approach

- Uses the UKB tool to disambiguate building a graph around the data of the contexts.
- Implemented to evaluate against the supervised approach.
- The algorithm wraps the preprocessed data and feeds it to the UKB tool for disambiguation.
- The processed data use SenseIDs to get their SuperSenses directly from WordNet.
- The SuperSenses get mapped on the input data and an xml file is created, containing all the disambiguated senses and their char positions in the input text.

IV. Evaluation

- Evaluation was done using manually annotated data from the three test domains (Figure 4).
- Adjectives got best results, due to the fact that WordNet provides only three SuperSenses for Adjectives.
- The results with monosemous words are remarkably better.
- An experiment to broaden the number of senses by using finer grained senses produced notably worse results.

V. References