

Computational Semantics and Pragmatics 2012

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Homework #3

Due: 26/11/2012, 10:00AM

Submit your answers in one single PDF file via [Blackboard](#).

Exercise 1. Choose one of these two options:

OPTION A: Attend the SMART Cognitive Science Lecture by Mark Steedman on *Linguistic Knowledge in Natural Language Processing*, on Friday 23/11. See <http://smartcognitivescience.wordpress.com/> for details. Write a report (min. 1 page, max. 2) that includes two parts (in one coherent text):

- an objective summary of the contents of the talk that covers the most important points made by the speaker (broad research area, approach, main claims, results, etc.), in your own words;
- a critical comment where you expose and justify your opinion on the work presented. Did you find it interesting? Were the speaker's claims convincing? Was there anything you did not understand?...

OPTION B: The sentence *"Every participant photographed some celebrity"* exhibits a particular type of semantic ambiguity known as *quantifier scope ambiguity*.

- Give two first-order logic formulas that represent each of the two possible meanings of this sentence.
- Which of these two meanings would you be able to obtain with the syntax-driven semantic construction mechanisms of homework#2 (provided the Haskell implementation in `COSPhw2.NL.hs` was extended to cover the words used in the sentence)? Explain why.
- Several approaches to account for quantifier scope ambiguity have been proposed in the literature. Find out about two possible approaches. Give references and briefly explain (in a couple of sentences) the main idea behind each of them. At least one of them should be an approach that employs underspecified semantic representations.

Exercise 2 [based on exercises 19.4 and 19.6 of Jurafsky and Martin (2009)]. Use WordNet's web interface at <http://wordnetweb.princeton.edu/perl/webwn> to search for the word 'scrap'. As you will see, the WordNet entry for 'scrap' includes 4 noun senses and 3 verb senses. Each sense includes a few synonyms (a *synset*), a definition in brackets (called a gloss), and one or more examples of use in quotes.

- Classify the four noun senses into homonymous and polysemous senses using the informal definitions of homonymy and polysemy given in class. For any senses you consider polysemous, give an argument as to how the senses are related (you may refer to the CoreLex basic types listed by Utt and Padó (2011), if you find it convenient).
- Examine the hypernym chain of each noun sense: first click on the link S: at the beginning of a sense and then, once a list of new links appears, click on the link *inherited hypernym*. If the hypernym chain has more than one path, consider only the first one.

Give the hypernym chain for each of the four noun senses. Do these chains provide information that could be used to distinguish between homonymous and polysemous senses? Are the chains consistent with your classification of these senses? Justify your answer.

- Briefly discuss how this method for distinguishing between polysemy and homonymy differs from the approach of Utt and Padó (2011).

References

D. Jurafsky and J. H. Martin. *Speech and Language Processing*. Prentice Hall, 2nd edition, 2009.

J. Utt and S. Padó. Ontology-based distinction between polysemy and homonymy. In *Proceedings of the International Conference on Computational Semantics (IWCS 2011)*, pages 265–274, Oxford, 2011.