German in Flux: Detecting Metaphoric Change via Word Entropy

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Recently, computational linguistics has shown an increasing interest in language change. This interest is focused on making semantic change measurable. However, even though different types of semantic change are well-known in historical linguistics, little effort has been made to distinguish between them. A very basic distinction is the one between *innovative meaning change*—e.g., German *brüten* 'breed' > 'breed, brood over sth.'—and *reductive meaning change*—e.g., German *schinden* 'to skin, torture' > 'to torture' (cf. Koch 2016, pp. 24–27). Metaphoric meaning change is an important sub-process of innovative meaning change. Hence, a computational model of semantic change should be able to distinguish metaphoric change from other types of change. Such a model would be beneficial for historical linguistics, cognitive science and natural language processing.

We build an unsupervised and language-independent computational model which is able to distinguish metaphoric change from semantic stability (Schlechtweg et al. 2017). We apply *entropy* (a measure of uncertainty inherited from information theory) to a *Distributional Semantic Model*. In particular, we exploit the idea of *semantic generality* applied in hypernym detection, to detect metaphoric change. German serves as a sample language, since there is a rich historical corpus available covering a large time period. Nevertheless, our model is applicable to other languages requiring only minor adjustments. With the model, we introduce the first resource for evaluation of models of metaphoric change and propose an annotation process that is generalizable to the creation of gold standards for other types of semantic change.

References: • Koch, P. (2016): Meaning change and semantic shifts. In: Pänivi Juvonen and Maria Koptjevskaja-Tamm, eds., *The Lexical Typology of Semantic Shifts*. De Gruyter Mouton. • Schlechtweg, D., Eckmann, S., Santus, E., Schulte im Walde, S. and Hole, D. (2017): German in Flux: Detecting Metaphoric Change via Word Entropy. In: *Proceedings of CoNLL*, 354–367.