

Superframes Manual

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1 Introduction

Superframes is an annotation scheme for semantic roles. Like other such schemes, it is essentially about pinning down, in a machine-readable form, “who did what to whom”. It is different from other such schemes, such as FrameNet (Baker et al., 1998), VerbNet (Kipper Schuler, 2005), PropBank (Palmer et al., 2005), VerbAtlas (Di Fabio et al., 2019), or WiSER (Feng et al., 2022) in a number of ways. It aims to avoid a number of practical problems in annotating with those schemes. Here’s how Superframes annotation works, in a nutshell:

1. Every content word (verb, noun, pronoun, adjective, or adverb) is a *predicate*. Every predicate evokes one of a few dozen *superframes*, which determines its coarse semantic class and the possible role labels for its arguments.
2. The syntactic *dependents* of a predicate can be *core arguments*, in which case they get one of the role labels defined by the superframe of the predicate, or *external arguments* or *modifiers*, in which case they are treated as evoking their own frame in which the predicate serves as a core argument.
3. There are only two main core role labels per superframe.

4. For predicates denoting change (or lack thereof) over time, some superframes have *aspectual variants* with role variants that allow to distinguish participants before, during, and after an event. This avoids having Source and Target as roles in their own right, which indicate the time sequence but suppress information about the nature of the relation that is changing.
5. Similarly, Superframes do not have the Agent role, which is often in conflict with roles indicating more specifically the agent's relation to other participants.
6. Doubt, ambiguity, and figurativity are systematically treated. If there is not one clear solution, the solution is to give two or more alternative labels.

Table 1 shows the superframes and their roles.

2 Tutorial Example 1: LOCATION

The superframe LOCATION has the two main roles has-location and location and indicates the location of the has-location, typically with respect to something, the location. The exact spatial configuration does not matter, it's all the same superframe.

- (1) Kim is sitting_{LOCATION} on a chair
- (2) The board was leaning_{LOCATION} against the wall

A change in location (i.e., motion) is expressed by the aspect frame LOCATION-CHANGE. It provides the aspect roles initial-location, intermediate-location, and target-location.

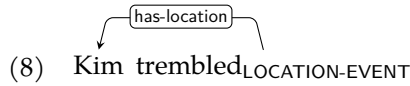
- (3) The vase fell_{LOCATION-CHANGE} to the ground
- (4) Kim left_{LOCATION-CHANGE} Boston
- (5) Kim went_{LOCATION-CHANGE} from the kitchen via the living room to the balcony

Motion with no clear start or end is framed as LOCATION-EVENT.

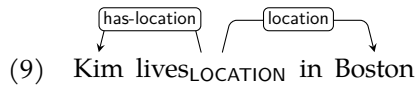
- (6) The jet soared_{LOCATION-EVENT} across the sky

SCENE		participant	scene	
SCENE-INIT		participant		target-scene
Creation		material		created
SCENE-DEINIT	initial-scene	participant		
SCENE-CONTINUATION	initial-scene	participant		
SCENE-PREVENTION		participant		target-scene
SCENE-NECESSITY		participant		target-scene
SCENE-POSSIBILITY		participant		target-scene
IDENTIFICATION		identified	identifier	
ORDER		has-order	order	
CLASS		has-class	class	
SUBCLASS		has-subclass	subclass	
QUALITY		has-quality	quality	
STATE		has-state	state	
STATE-CHANGE		has-state		target-state
EXPERIENCE		experiencer	experienced	
ACTIVITY		is-active	activity	
ACCOMPANIMENT		accompanied	accompanier	
Depictive		has-depictive	depictive	
ASSET		has-asset	asset	
CAUSATION		caused	causer	
COMPARISON		compared	reference	
EXPLANATION		explained	explanation	
LOCATION		has-location	location	
LOCATION-INIT		has-location	transitory-location	target-location
Ingestion		ingested	transitory-location	ingerster
LOCATION-DEINIT	initial-location	has-location	transitory-location	
Excretion	excreter	excreted	transitory-location	
LOCATION-CHANGE	initial-location	has-location	transitory-location	target-location
MEANS		has-means	means	
MESSAGE		topic	message	
MESSAGE-INIT		topic		target-message
MESSAGE-DEINIT	initial-message	topic		
MESSAGE-HABIT		topic	message	
PART-WHOLE		part	whole	
POSSESSION		possessed	possessor	
POSSESSION-INIT		possessed		target-possessor
POSSESSION-DEINIT	initial-possessor	possessed		
POSSESSION-CHANGE	initial-possessor	possessed	target-possessor	
POSSESSION-CONTINUATION	initial-possessor	possessed		
QUANTITY		has-quantity	quantity	
SENDING		sent	sender	
SEQUENCE		follows	followed	
SOCIAL-RELATION		has-social-relation	social-relation	
SOCIAL-RELATION-INIT		has-social-relation		target-social-relation
SOCIAL-RELATION-DEINIT	initial-social-relation	has-social-relation		
TIME		has-time	time	
NONCOMP		has-noncomp	noncomp	

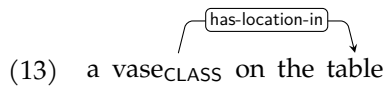
Table 1: The superframes and their roles. TODO: what to do about processes like piloting an airplane, visiting someone, having sex with someone? Frame them as EXPERIENCEs and ACTIVITYEs done WITH someone or something? Or rather as LOCATION/SOCIAL-RELATION PROCESSES?



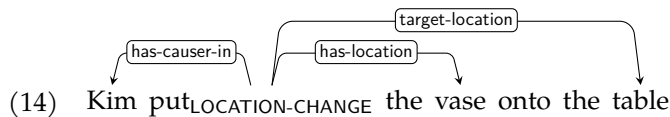
There are three further aspect tags: -HABIT for habitual states, -CONTINUATION, and -PREVENTION.



When a predicate is *modified*, the modifier is treated as evoking another frame, of which the predicate is one argument. Thus, the syntactic dependency in this case goes from the argument to the frame instead of the other way around. To indicate this, we use the normal role label, but suffix it with -in to indicate that the predicate fills this role *in* the frame evoked by the modifier. For example, the highlighted predicates in the following examples play the has-location role in a LOCATION frame evoked by the modifier.



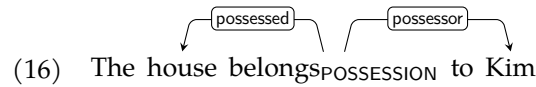
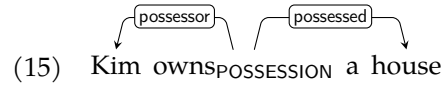
Non-core arguments, that is, arguments of predicates that do not fill a role in the main frame evoked by it, are treated much like modifiers. For example, the subject in the following example is the causer of the LOCATION-CHANGE, so it is treated like a CAUSATION modifier assigning the LOCATION-CHANGE frame the has-causer role.



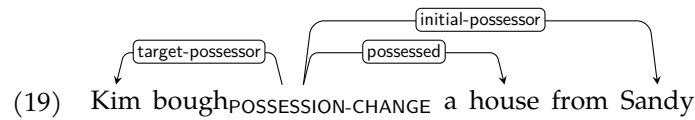
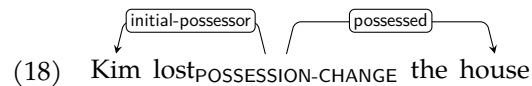
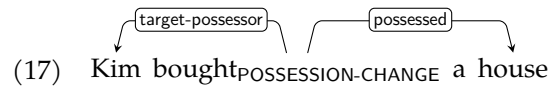
Note that the frames in the previous examples for modifiers and non-core arguments are implicit, e.g., in the last example, we did not write CAUSATION anywhere. Rather, the fact that the non-core argument evokes a CAUSATION frame is implicitly communicated by using a role from that frame in the edge label.

3 Tutorial Example 2: POSSESSION

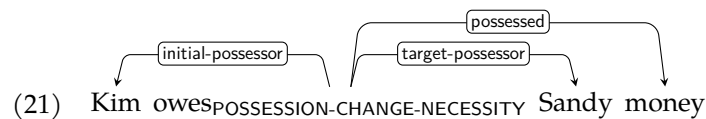
In this section, we work through similar configurations as in the previous, but this time using the POSSESSION superframe as an example. First, two examples of verbs indicating states of possession, illustrating that the semantic arguments can be switched around wrt. the syntactic arguments for different predicates:



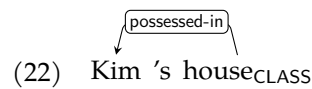
Next, examples of possession change:



The predicate *owe* expresses a legal necessity to transfer possession of something, giving us an opportunity to introduce the *modal tag* -NECESSITY:



Finally, an example of a POSSESSION modifier:



4 Aspect and Modality Tags

5 Superframes

6 Figurativity and Idiomaticity

7 Odds and Ends

References

- Baker, C. F., Fillmore, C. J., and Lowe, J. B. (1998). The Berkeley FrameNet project. In *COLING 1998 Volume 1: The 17th International Conference on Computational Linguistics*.
- Di Fabio, A., Conia, S., and Navigli, R. (2019). VerbAtlas: a novel large-scale verbal semantic resource and its application to semantic role labeling. In Inui, K., Jiang, J., Ng, V., and Wan, X., editors, *Proceedings of the 2019 Conference on Empirical Methods in Natural Language Processing and the 9th International Joint Conference on Natural Language Processing (EMNLP-IJCNLP)*, pages 627–637, Hong Kong, China. Association for Computational Linguistics.
- Feng, L., Williamson, G., He, H., and Choi, J. D. (2022). Widely Interpretable Semantic Representation: Frameless Meaning Representation for Broader Applicability.
- Kipper Schuler, K. (2005). *VerbNet: A broad-coverage, comprehensive verb lexicon*. PhD thesis, University of Pennsylvania.
- Palmer, M., Gildea, D., and Kingsbury, P. (2005). The Proposition Bank: An annotated corpus of semantic roles. *Computational Linguistics*, 31(1):71–106.