The Notion of Affinity in Semantic Structures

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Example:

Semantic structure S_1 :

"I live in and my name is."

$$ssig(S_1) = [\mathbf{V}_1 \, \mathbf{A}_{1,2} \, \mathbf{V}_2 \, \mathbf{A}_{1,3} \, \mathbf{V}_3 \, \mathbf{A}_{1,4} \, \mathbf{V}_4 \, \mathbf{A}_{4,5} \, \mathbf{V}_5 \, \mathbf{A}_{5,6} \, \mathbf{V}_6 \, \mathbf{A}_{6,7} \, \mathbf{V}_7]$$

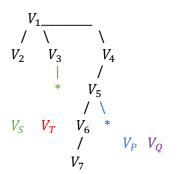
 $text(V_1)$ = "live"

 $text(V_S)$ = "a car"

 $text(V_T)$ = "Sofia"

 $text(V_P)$ = "Dimitar"

 $text(V_O)$ = "Poison"



We have semantic particles which demonstrate affinity for specific properties. This means the particle attracts unconnected V-particles with specific combination of properties in their signature. It also demonstrates anti-affinity i.e. repels unconnected V-particles which have different combination of properties in their signature.

Affinity field of the semantic structure S – a discrete field which defines affinity / anti-affinity force $F(V_i)$ between the particle V_i of the semantic structure S and a test particle $V_{test}(P)$

 $F(V_i, V_{test}) = F_i(P), i \in V(S)$

 $\mathbb{v}(S)$ denotes the set of indices of the V-particles in the semantic structure S

P is the properties tree $ptree(V_{test})$ of the test particle V_{test} . We will assume general form of P.

The affinity force $F_i(P)$ is a function that maps the property tree P to a signed real number. The function $F_i(P)$ identifies specific features of the property tree such as the presence of specific subtree $\mathfrak{T} \subset P$ or a specific set of properties $\mathcal{S} \subset P$ toward which V_i has strong affinity (attraction). Note that F_i has implicit dependence on S as well i.e. in a context different than S F_i could have different values for the same P.