

## Semantic Templates

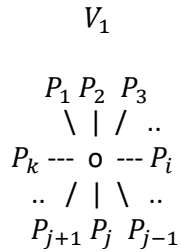
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*Semantic Template* is a semantic structure represented by a DAG as any other semantic structure. Semantic templates are context-dependent – in other words we have different set of active semantic templates in each context. Semantic templates are created through semantic inference capturing previous knowledge of the inference input and output. Semantic templates are tool for generalization based on previously made decisions or on pre-existing knowledge.

The *Semantic Template* is a special kind of semantic structure built by *incomplete V-particles* and *incomplete A-particles*.

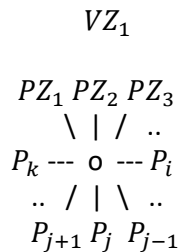
### Incomplete V-particle

Let us look into an example *V-particle* which we will name  $V_1$ :



Every *V-particle* contains a rooted property tree where each property which is not a leaf is connected via property association link to another property (its child). Each property  $P_j$  is represented by its property signature  $\mathbf{p}_j$  given with

$\mathbf{p}_j = [\mathbf{r}_1, \mathbf{0}, \mathbf{r}_2, \mathbf{0}, \dots, \mathbf{0}, \mathbf{r}_k]^T$  where  $\mathbf{r}_i, i = 1..k$  are the proper regions in the property signature. proper region is such area of the property signature which is created in order to serve particular binding force between this property and another property. No further expansion of this region can increase the binding force between the two properties. The total binding force between two properties is given as the sum of all regional binding forces minus the sum of all regional repulsion forces. For details see [Note on Binding an Association Property to Semantic Property](#). Let us assume that some of the properties in a semantic particle are replaced by dummies:



Here with *PZ* we are denoting dummy properties which property signature contains only zeros:

$$\mathbf{pz}_j = [\mathbf{0}, \mathbf{0}, \dots, \mathbf{0}]^T$$

Those properties have zero semantic mass which leaves the opportunity of getting displaced fully-fledged semantic properties which fit the hierarchy by having appropriate semantic mass and appropriately positioned semantic regions.

The position of a  $PZ$  in the property tree of a templatized semantic particle is a hint that with a higher probability than if not occupied we should attempt filling the position with a property which balances the tree to form a viable conjecture matching the inference hypothesis.

A templatized particle i.e. a  $V$ -particle which has fully templatized and partially templatized properties will be denoted with  $VZ$ .