# ~~Thought~~ Synthesis of Semantic Structures

## Particle model for thought synthesis

### Semantic tree

Each V-particle signature can be represented by a semantic tree of the signatures of sub-particles

Operations on semantic trees : include(another\_thought), infer(another\_thought), extract(root\_of\_subtree), relate(another\_tree), compare(another\_thought, max\_dist), exclude(subtree), exclude(list\_of\_nodes), merge(another\_tree),

### Association Particles

The Association Particles a.k.a as -particles fulfill multiple roles:

* Identify and attract matching particles in the synthesis of new semantic structures
* Transform the compound particle signature such that comparison and semantic distance evaluation among close semantically particles will be obvious *(I do not like this motivation – clarify and elaborate)*.

*Note:* the state of the -particle instance which will be associated with two -particles will depend on the context, on the particle signatures and on the semantical construct in which those particles appear. -particle does different things with the thought signatures of the surrounding -particles.

Let us consider the compound semantic structure represented by the text “*Dimitar’s book*”. We immediately recognize three -particles in this structure:

with = “*Dimitar*”

with = “*’s*”

with = “*book*”

There is a single enclosing context and there is a single thought in it:

*Dimitar is staying at home now. His house is located in Hudson, Massachusetts.*

The following -particles are defined in the global context ():

with =*”book”*

with =*”paper”*

with =*”wood”*

with =*”rectangle”*

with =*”page”*

with =*”letters”*

with =*”has”*

with =*”is”*

with =*”indicates”*

with =*”made of”*

with =*”owner of”*

with =*”ownership”*

with =*”shape of”*

The following thoughts are recorded in :

[ -> *“book is made of paper”*

[] -> *“paper is made of wood”*

[] -> *“book has shape of rectangle”*

[] -> *“book is made of pages”*

General Form for the Rules of inference for a set of -particles

### Recombination Particles and Conservation Laws

### Affinities and Affinity Sets

Let us consider a particle denoted by . Let us consider the case when the particle combines from the right with another compound particle as shown below

The affinity for each of the two -particles gets calculated and information about the affinity value gets recorded inside the -particle which is intermediary for the two -particles. In this case the intermediary is which stores information on chosen combination . Any new attempt to combine the particle with another compound particle will involve -particle clone of . This clone already has learned ’s affinity for and will encourage recombining with such -particles which have close enough semantic distances to .

Now, let us consider the compound particle . This particle has been initially combined with another compound particle where is not close to semantically.

Example: Let us consider the compound particle *“Dimitar’s book”*, represented by

Here:

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