

Correlation Technology – Supported Relations

[0491] In a currently preferred embodiment, the value of the bond member 184 of the current node 603 examined by the association function 710 permits the relation classifier function 720 to classify the current node 603 as an instance of or realization of a specific relation, such relation being one case of the many well known cases of relation, examples of which include, but are not limited to, broad classes of relation such as extensional relations (state) and intentional relations (concept), and specific classes of relation, such as, but not limited to, class relations (taxonomic), mereological relations (parthood, part/whole), topological relations (attachment, containment, relative position), existential relations (impact on the relata), action relations (e.g. agent, action, object), transitional relations (state change), causal relations (implication), dependency relations (e.g. abstraction/realization), semiotic relations (pragmatic, semantic, syntactic), mediated relations (ownership), conventional relations (e.g. representation and plan), property-based relations (e.g. contrast, inherence, logical). Examples of some relations identified by the relations classifier follow.

[0492] Class Relation: Class relations are used to construct taxonomies, ontologies and software object domains, which are all formally structured graphs or networks. "Class" in this context generally refers to an idealized, or abstract, or non-specific instance, of a thing. For example, in a zoological taxonomy, the class "bird" does not refer to any actual, individual bird, but rather to all instances of bird. Likewise the class "parrot" does not refer to any actual, individual bird, but rather to all instances of parrot. The class parrot relation "type-of" (as in "parrot is a type-of bird") to the class bird is unequivocal, and ensures that in a hierarchical zoological taxonomy that the class "bird" is parent class to the class "parrot". Although the class relations manifested in an ontology can be substantially more complex than those permitted in a taxonomy, the classes on each side of the relation are always idealized, abstract, or non-specific.

[0493] Mereological Relation: Mereology is the theory of parts and wholes. Although the study of mereology extends into philosophy, as a practical matter, mereology provides definitions and axioms for relations such as "is part of", "composes", "is composite", and others. Simple examples of mereological relations include, "the tiles in a Roman fresco compose a priceless piece of art [tiles compose art]", "the tile is part of a Roman fresco", "his hand is part of his body", "the pitcher is a part of the team". Mereological relations can obviously convey far more complex and nuanced descriptions of the world.

[0494] Topological Relation: Topological relations are descriptive relations. For example, "Water in cup" is a containment relation, as is "diving bell holds air". "Check stapled to tax return" is an attachment relation as is "button on shirt". "Woman second to the right in the photograph" is a relative position relation, as is "flags above the crowd". All spatial relations are topological relations.

[0495] Action Relation: Action relations require an "agent" that will "do something to something". Examples include "men move piano". "boy breaks window", "baseball breaks window", "woman drove car", "postman delivered mail". Any action by any agent upon an object can be expressed with an action relation.

[0496] Transitional Relation: Transitional relations capture state changes. "Baby grew to adulthood", "search engines became obsolete", and "solid steel melted into a flowing river of metal" are all examples. Transitional relations all require a "before state" and an "after state".