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Metaphor, Metaphor Processing,
Metadata (DAML, RDF), SVG,
Ontologies

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Title of this paper:

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Technology and
Artificial Intelligence

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Metaphor Processing

Is about computing using patterns that are NOT exact match.

- Business processing is only exact match.
- Metaphor processing is not the same as fuzzy logic or fuzzy sets.
- Metaphors are used in science and technology to extend knowledge, discover new ideas and concepts.

The Albatross Metaphor

- Functional observation of birds in flight have long been used to glean notions that further the design and development of machines that fly.

SVG Animation Metaphor

- The SVG animation file which accompanies this set of slides is an instance of deBono diagram combined with Lakoff spatial metaphor.
- This particular deBono diagram depicts goal oriented group behaviour in pursuit of achieving a goal but is blocked by an obstruction.
- Lakoff spatial metaphors use orientation in three dimensional Euclidean space as representation.

- Lakoff spatial metaphors have an “origin” (locus) or “starting place” (“zero”) based on the body of the person using the metaphor.
- With substantial ease adult humans assign the origin of this space to being at the eyes of the self, or generally the outerbody surface (“my outside”) and as needed the innerbody volume bounded by that outerbody surface (“my insides”).
- Humans are able to effectively “move” the origin from the body of self to some other location. This other place then gives the “zero perspective”.

HML

- The Human Markup Language (HML) structured vocabulary provides a standardized reference for the representation of socio-cultural information conveyed and implied in the deBono diagram.

deBono Diagram

- Visually the deBono diagram shows that the progress of a group is halted by an obstruction, and the HML terms referenced depict that there is a concomitant socio-cultural aspect to such deliberate deflection or blockage.

Graphs show what?

- The edges of the graph are, more or less, simply a concrete way of depicting the relationships of the nodes. Otherwise we have a very large bag of marbles.
- The nodes are a means of specifying values and symbols which are separated from each other.
- The relationships are dynamic and hence change with time.

Damasio elements & XGMML

- The graph structures are used to depict multiple levels, of conceptual activity. The most basic level is atoms of description of low-level system instances, such as properties of the self through time and also properties of external-to-self objects, in time.
- Collections of such properties constitute contexts. There are many simultaneous contexts. Their relationships are dynamic and so change with time.

Neural net comparison

- Neural activation in neural networks also change dynamically and with time and it is this dynamic that the graph structure models, although the nodes do not model neurons.

Example Damasio element

- In example1 graph structure node 36 is the locus for tying-in the XML topic map element which provides the semantics for the obstruction in the SVG animation. Also tied to that SVG element is a collection of particular HML terms. The XGMML graph unifies the content and intent of the SVG animation, its XTM topic map, & relevant DAML HML terms. It provides a means of identifying a situated self and modifications to that self via contextualized interactions with external objects.

Damasio elements

- In Damasio terms the system detects its own state (the “proto-self”), external object’s properties, & creates a graph representation of both. The “post-object self” is represented as well. A second-order view is possible which can be reflected back on external objects to provide further illumination of them.

Concepts and Knowledge

- Concepts are dynamic and are subgraphs which reference various contexts (themselves subgraphs) and indicate the contextual constituents of the concept.
- Knowledge is the creation of a knowledge subgraph which references the members of the concepts which constitute it. The creation is dynamic with time varying relationships. Thus, in effect, knowledge is an experience of the “self”, but only during the reference or identification period, because membership changes dynamically.

OpenCYC and SUMO

- DAML is used in OpenCYC & SUMO to express taxonomic interrelationships, amongst the general physical, cultural and social knowledge coded there. Terms like `#$PurposefulAction` and `#$performedBy` are related to other CYC concepts represented, in such a way that a reasoner can perceive “connections” not directly stated in input.