CONCEPT GRAPHS

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OVERVIEW

Conceptual graphs are a neat way of representing predicate calculus in two dimensions. Morphic to frames and semantic nets also. The main point is that they are a *representation* for knowledge engineering. Their *implementation* can be the same as any predicate calculus based formalism.

This means that if your visualization process is like conceptual graphs, then they help to record what you want. Their "goodness" is a function of the user. Their relative "betterness" is not an implementation issue.

Expressability: Schrank has built elaborate script models for three-line "stories". The value of this work is debatable, it captures some things (object-object relations), is weak on some (time, space,...) and is wrong on some (mental-states, complex events,...).

Punch line: Conceptual graphs solve nothing new, but might help building models on paper.

PROBLEMS

Basically, concept graphs address terms (ie data objects) but not formulas (ie logical structures of data objects).

Not an implementation formalism.

Does not support deduction. Inference over a conceptual graph reduces to graph matching, which is exponentially expensive.

Does not support quantification. Sowa's treatment (in Conceptual Structures) has problems at the implementation level.

Any two-dimensional (ie non-linear) representation requires parallel processing. Treated sequentially, conceptual graphs reduce to linear expressions.

Meta-punch line: A good representation should make intuitive facts look simple, and it should support formal inference. Conceptual graphs work well only on toy problems.

SOLUTIONS

The version of propositional calculus supported by conceptual graphs is an unrefined version of Losp [see Sowa, p. 137ff].

The Losp Database Management System uses a concept graph formalism for ground terms. In that sense, the two systems are integrated. Losp, however, provides solutions for representation of formulas and quantification that are missing from other work. And it runs in parallel.