

Linear Logic Maybe

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Dear All

I am working on an algebra for some language processing. The language processing includes the combination of nouns, verbs and adjectives.

So I came up first with the following connectives:

A & B: Conjunction

A ∨ B: Disjunction

And some rules, for example disjunctive normal form:

$A \& (B \vee C) \longrightarrow (A \& B) \vee (A \& C)$

etc..

This works pretty well for some language phenomena. For example "roof, window and door", kann be modeled by &, and so on.

Now I was introducing the following two connectives:

A ! B: Composition

A ? B: Guard

And the rules are as such:

$A ! (B ! C) \longrightarrow (A ! B) ! C$

$(A \& B) ! C \longrightarrow A ! C \& B ! C$ (i)

$A ! (B \& C) \longrightarrow A ! B \& A ! C$ (ii)

etc..

$(A ? B) ! C \longrightarrow (B ! A) \& (B ! C)$ (iii)

etc..

This works pretty well for some language phenomena. For example "the green door is open" can be modelled by $(\text{green?door})!\text{open}$.

But now, as I don't have any clue what algebra this might be, so that I can look up the algebra's properties, many questions arise. For example

- 1) Does the order of application of the rules (i) and (ii) make any difference in the normal form? (answer = yes, guess why?)
- 2) Similar questions in the interaction between ? and !, not yet answered for my self.

Any pointers welcome?

Best Regards

Spuntik III