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On a Semantics for Active Logic

The object of study for this thesis is the problem of modelling the reasoning of real-world agents. In particular, a semantics for active logic, which is a logical formalism conceived to be able to cope with the passing of time as well as inconsistency, is analysed, criticised and refined. Based on what is called perception functions, a notion of perceived temporal structure is defined, which allows inconsistent knowledge bases to have models. Using such structures, a consequence relation called active consequence is constructed. Active consequence was previously believed to coincide with classical logical consequence when restricted to a certain subset of the language and consistent premises. We show that this identity does not hold due to the problem of Σ -undeterminism – that there are sentences for which it cannot be determined whether they follow actively from a given set Σ – and suggest a refined definition of active consequence as a solution. Our main result, however, is that we show that active consequence is explosive, that is, that anything follows actively from a direct contradiction. Consequently, and contrary to what has been previously claimed, a logic based on this consequence relation is not paraconsistent.

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