

Title	現存在の様相論理: エージェントの信念に対する内在的なアプローチ
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Citation	
Issue Date	2022-09
Type	Thesis or Dissertation
Text version	author
URL	http://hdl.handle.net/10119/18048
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Abstract

We aim at bringing together two philosophical themes: one is modal logic, in particular Jaakko Hintikka's epistemic logic, in analytic philosophy; another is existentialism, in particular Martin Heidegger's Dasein, in continental philosophy. Both topics are mundane within their respective academic circles, however, seldom are they thought of in concert with one another.

Specifically speaking, we discover a fatal fault in ordinary modal logic for belief: it merely depicts agents' belief from a completely external aspect, and hence it is actually rather non-intuitive and especially very hard and cumbersome to use in most practical situations. In order to repair this problem, we import from Heidegger's philosophy the notions of Dasein, authenticity and care, based on which we manage to reinterpret the traditional Kripke model and end up with the brand-new invention of modal logic of Dasein. Unlike normal epistemic logic, our modal logic of Dasein takes an intrinsic approach to model agents' belief, so that not only it is relatively compact and handy to manipulate, but it also successfully isolates each agent's private belief into mutually separate modules which will never affect other agents, a crucial feature which indeed conforms to our everyday intuition that anyone is able to secretly alter his own belief at any time. In a word, modal logic of Dasein is quite user-friendly, both for human beings and for AI systems.

After proposing the most general modal logic of Dasein, we then choose to concentrate on a more concrete version of the semantics in detail, which naturally retains a large portion of valid axioms and rules of the vanilla doxastic logic. We come up with several vivid examples so as to advocate the use of our logic in practical application, which also intuitively demonstrate that our modal logic of Dasein is paraconsistent regarding agents' belief, namely, it is possible for an agent to hold inconsistent beliefs, a deed not uncommon at all exactly by us humans. We continue to show some more interesting behaviors of modal logic of Dasein, and most strikingly, our formal treatment of the logic through axiomatization turns out to shed a penetrating beam of light over the problem of closure principle in epistemology, which has so far brought about prolonged confusion and debate among philosophers. We at last yield a sound and strongly complete proof system for our modal logic of Dasein.

In the end, we conclude this thesis with a number of prospective outlooks for the future work from various perspectives.