研究室名	上出哲広研究室　学会発表

学会名	The 7th International Conference on Fuzzy Systems and Data Mining (FSDM 2021)
演題名	Inconsistency-tolerant hierarchical probabilistic computation tree logic model checking and its application to clinical reasoning verification
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内容	Model checking is a computer-assisted method of verifying concurrent systems that can be modelled using state-transition systems. In this study, we introduce an inconsistency-tolerant hierarchical probabilistic computation tree logic (IHpCTL) to establish a new extended model-checking paradigm named IHpCTL model checking. This proposed IHpCTL model checking is aimed at verifying randomized, open, large, and complex concurrent systems; it is constructed on the basis of several previously established extensions of the standard probabilistic temporal logic known as probabilistic computation tree logic (pCTL), which is widely used for probabilistic model checking. We show that the IHpCTL can be embedded in pCTL and is relatively decidable with respect to pCTL. The results of the proposed method indicate that the existing pCTL model checking algorithms can be effectively reused for IHpCTL model checking. We also propose a new application of IHpCTL model checking to clinical reasoning verification. The concurrent system for clinical reasoning is considered as randomized, open, large, and complex. On the one hand, model checking is typically used for software verification; on the other hand, an application of model checking is newly proposed in this study for verifying clinical reasoning systems. As a future direction of this study, we intend to realize an automated method for developing and verifying a practical clinical reasoning model. This model could be automatically developed using machine-learning technologies based on data evaluated by medical doctors and automatically verified thereafter by IHpCTL model checking.
関連画像	