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概要
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We develop logics and translations for inconsistency-tolerant model checking that can be used to verify systems
having inconsistencies. Paraconsistent linear-time temporal logic (pLTL), paraconsistent computation tree logic
(pCTL), and paraconsistent full computation tree logic (pCTL*) are introduced. These are extensions of standard
linear-time temporal logic (LTL), standard computation tree logic (CTL), and standard full computation tree logic
(CTL*), respectively. These novel logics can be applied when handling inconsistency-tolerant temporal reasoning.
They are also regarded as four-valued temporal logics that extend Belnap and Dunn's four-valued logic. Translations
from pLTL into LTL, pCTL into CTL, and pCTL* into CTL*, are defined, and these are used to prove the theorems for
embedding pLTL into LTL, pCTL into CTL, and pCTL* into CTL*. These embedding theorems allow the standard
LTL-, CTL-, and CTL*-based model checking algorithms to be used for verifying inconsistent systems that are
modeled and specified by pLTL, pCTL, and pCTL*. Some illustrative examples for inconsistency-tolerant model
checking are presented based on the proposed logics and translations.
情報電子工学科工学科　論文発表
Foundations of inconsistency-tolerant model checking: Logics, translations, and examples
Agents and Artificial Intelligence, 10th International Conference ICAART 2018 Revised Selected Papers, Lecture
Notes in Artificial Intelligence 11352, pp. 1-31, Springer, 2019.